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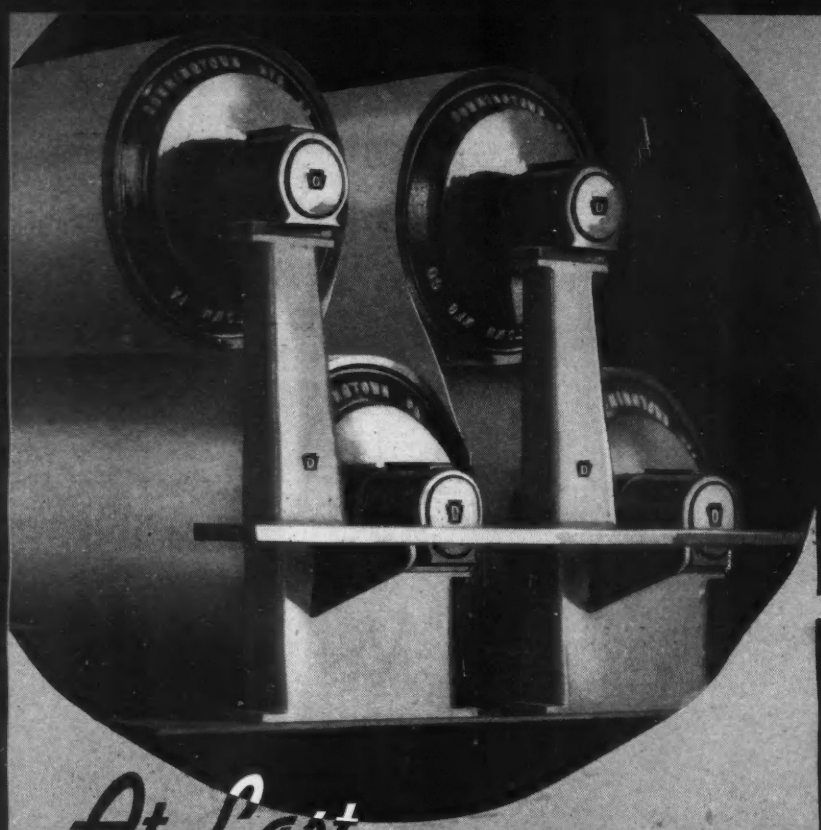
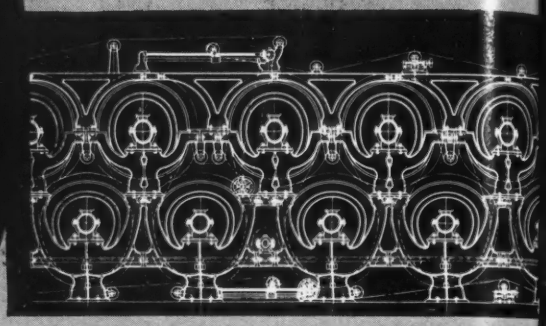
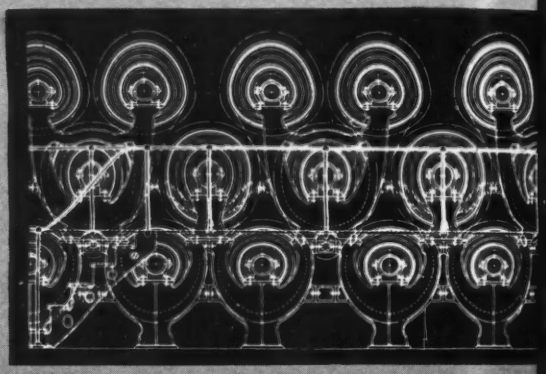
PAPER TRADE JOURNAL

JANUARY 17, 1946



Drawings below illustrate, top to bottom, conventional designs of Downingtown Two Deck, Three Deck, and Vertical Dryers.





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Paper Making Machinery

PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.
Established 1872

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GEO. E. LOCKWOOD
President and Treas.
ARTHUR E. GORDON
Vice-President
JOSEPH P. HORGAN
Secretary

HENRY J. BERGER
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F. B. GROSSE
Make-Up Editor
LYNNE M. LAMM
Washington Correspondent

Western Representatives:
H. K. VINTON
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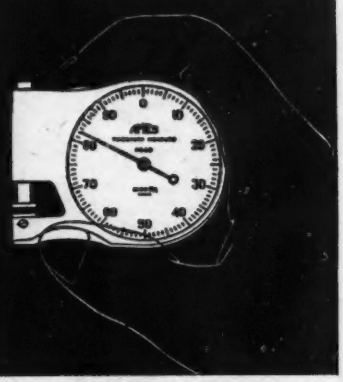

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(NEWS ITEM: *The Container Industry has found a new use for Paper—in screw cap construction—and expects to use 23 million pounds of paper annually for this purpose.*)

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Every day, American industry is finding new uses for paper—paper cans for paints . . . paperboard containers for tooth paste . . . molded fiber for alarm clock cases . . . paper twine for wrapping. These new uses call for new standards of lightness and toughness, new standards of quality in performance. New responsibilities—new opportunities for the Pulp and Paper Industry.

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The Puseyjones Research and Development Committee, formed within this Organization to help in our service to America at War, now shares with the Paper Industry many of the lessons learned in the use of new materials and new techniques—and which are now so co-ordinated as to be of practical, workable value.

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Vol. 122, No. 3

PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

January 17, 1946

Outlines Marathon's Packaging Development

New Canadian Mill of Corporation To Provide Continuous Flow of Raw Material and Insure Continuity of Employment — H. S. Craig To Manage Kimberly-Clark Longlac Plant — Other News.

APPLETON, Wis., January 14, 1946—Progress in the development of paper packaging and the part played by Marathon Corporation was outlined Thursday evening, January 10, by P. S. Calhoun, president of the H. J. Cole Company of Kansas City, Mo., in a talk at the North Shore Country Club before 200 members and guests of the Quarter Century Club of Marathon at Menasha, Wis. The occasion was the club's third annual banquet.

Mr. Calhoun also spoke briefly of the new Canadian pulp mill of Marathon, which will provide a continual supply of raw material to the corporation.

"Marathon's present setup is the best in North America, insuring a continuity of employment that can't be matched," D. C. Everest, Wausau, Wis., the corporation's president, told the group. He outlined Marathon's play for employment of returning veterans as well as the development of the concern since he became connected with it in 1909.

Leo Croy, vice president reviewed the last 25 years at Marathon, citing statistics to show the firm's growth. He said that with a 58% increase in the population of Neenah and Menasha in 25 years, Marathon has increased its employes 225%. In 1920, there were 489 persons employed in the Menasha plant, and by 1945 the figure had grown to 1,575. Sales of Marathon have increased five times in the period, with a $5,500,000 volume in 1920 as compared with $27,500,000 last year.

Twenty-three employes, with the concern 25 years, were honored. Certificates of membership and certificates for gold watches were distributed by Roy Sund, production manager, and Mr. Everest.

H. S. Craig to Manage LongLac Plant

The appointment of H. S. Craig as manager and B. J. Donovan as assistant manager for the new LongLac Pulp and Paper Company, Limited, was announced by the Kimberly-Clark Corporation in a report which outlined other organizational planning and also told that headquarter offices were being established at 263 Adelaide street, West, in Toronto. LongLac Pulp and Paper Company is the newly announced Kimberly-Clark subsidiary which will undertake the construction of a modern chemical pulp mill and a residential community in an undeveloped section of the Superior Lakehead area, in the Province of Ontario. Winter headquarters have already been established at Schreiber.

Today's appointments, made by Cola G. Parker, president of Kimberly-Clark, primarily cover the construction period for the new mill. Executive staff direction for this period will center largely under C. W. Nelson, chief engineer for the parent company, W. H. Swanson, an assistant general superintendent for Kimberly-Clark and R. W. Lyons, general manager of the Woodlands Department. Mr. Nelson will devote the majority of his time for the period ahead to LongLac as will Mr. Swanson, whose staff will be in charge of process and operating phases of the new project. B. F. Smith has been named project engineer and G. H. Spaulding will handle power responsibilities. Other Kimberly-Clark departments will also function in the LongLac development.

Additional appointments include the following department heads: R. J. Shemanski, controller, F. A. Laughlin, purchasing and traffic, and H. C. Laundy, industrial relations. A. F. Buell, now in residence at LongLac, will be in charge of Woodland operations. Stadler, Hurter & Company of Montreal have been retained as consulting engineers. Announcement of LongLac officers, directors and operating heads is expected to be made at a later date.

Neenah Foundry Additions Completed

The Neenah Foundry Company, Neenah, Wis., is now occupying four recently-completed additions, which cost a total of about $25,000. The first of the additions was the 50 by 40 foot pattern shop, which has been equipped with pattern making machinery. The second was the extension to the squeezer molding bay and is 60 by 60 feet. It accommodates six molding machines and a sand conditioning machine.

The third addition was the extension to the sand slinger molding bay and includes the cleaning department. New machinery is to be provided for this addition. The fourth is a new office building which contains seven rooms for offices and clerical space, with a meeting room in the basement.

About 200 persons are employed by the company.

To Build New Electrical Substation

Construction of a new $60,000 substation by the Kaukauna, Wis., municipal utility to connect the city electrical distribution system with the plant of the Wisconsin Michigan Power Company will improve the operation of all the supply facilities of the Kaukauna utility, according to the Wisconsin State Public Service Commission, which has authorized the improvement.

(Continued on page 32)

Duplicating Tax Prospect Faces Industry

Canadian Paper Manufacturers May Get Little Tax Relief If the Rejection of Dominion Proposal To Collect Taxes Is Maintained— Pulpwood Price May Rise To $15 This Year — Other Mill News.

MONTREAL, Que., January 14, 1946—Just when it looked as though the pulp and paper industry were getting on an even keel, with business weather reports indicating "fair weather ahead" as far as this particular industry is concerned, a note of grave uncertainty regarding the financial prospects of the industry has been injected into the picture. This comes in the form of a bombshell thrown into the current Dominion-Provincial negotiations for an after-war settlement of the thorny subject of taxation.

Prior to the war, and during the first two years of it, certain taxation was duplicated by the federal and provincial governments and in some cases even by municipalities. Included in this taxation was the income tax as applied both to individuals and to corporations. In 1942 an agreement was effected whereby, for certain considerations, the provinces (and municipalities) agreed to forego this tax for the duration of the war, leaving to the Dominion the sole right to collect income tax for the time being. For all kinds of business this was a great relief, as operators knew where they were at in their accounting and did not have to fill out duplicating returns for varying tax schedules and increasingly heavy total assessments.

Recently negotiations have been proceeding through a Dominion-Provincial Conference for a three-year continuation of this method through the transitional period. To this end the Dominion made what were generally considered as generous proposals for compensatory benefits to the provinces. At initial meetings of the Conference the proposals submitted by the Dominion authorities appeared generally acceptable, a spirit of all-round co-operation being reported. In anticipation of a satisfactory settlement of the problem, the federal authorities were preparing for a thorough revision of the income tax structure, and were promising substantial relief in taxation, especially as applied to the tax on corporations.

Now, however, like a bolt from the blue, Premier Drew, of Ontario, has come out with a flat rejection of the Dominion proposals and a demand for a return to the provinces of all the rights they formerly enjoyed in respect to every form of taxation. If he maintains this attitude at the adjourned meeting of the Conference, then failure of the negotiations is inevitable and business corporations will be faced once more with duplicate and even triplicate corporation income taxes, with prospects that the total in taxes will be equal to the peak of wartime taxation and probably surpass that peak. The prospect thus opened up injects grave uncertainty into the future of all corporations, including of course all pulp and paper companies.

Still further uncertainty as to the immediate future has been supplied by ex-Premier Godbout, of Quebec, who takes issue with a statement of federal Finance Minister Illsley, to the effect that for the purposes of the 1942 agreement the war ended September 2, 1945, and that as a result the agreement will end March 31, 1947, Ottawa continuing to collect the taxes exclusively until that date. Mr. Godbout says this statement is incorrect, maintaining that existing statutes authorize the provincial Lieutenant-Governor-in-Council, which means the Provincial Government, "to proclaim that all of the provincial taxes, the imposition of which had been suspended, are imposed anew and have become demandable once more" after one month's notice. He has quoted several articles from the 1942 agreement to claim that all suspended Quebec taxes can be reinstated and collected once more merely by proclamation of the Lieutenant-Governor-in-Council.

Aid for Forest-Farm Colonies

In furtherance of its aim of establishing permanent forestry communities throughout the forest regions of the province, the Quebec Government is devoting special attention to forestry-agricultural colonies in the Gaspe Peninsula. The colonies are at Grande Vallee, in Gaspe North, founded in 1938, and St. Edgar in Bonaventure County, established in 1943. Members of these settlements find a living in the permanent exploitation of agricultural and forestry resources, their farming keeping them occupied in the summer and their wood lots providing work in the cutting of pulpwood in the winter. The work is done on a co-operative basis and is proving very successful, it being stated that the men are provided with all-the-year-round revenues, and do not have to leave their homes for lumber camps in the dead season of farming. The hope has been expressed in the Legislature that the work achieved in Gaspe Peninsula will help the Colonization Department to establish similar colonies in Chicoutimi, Lake St. John and Abitibi districts.

Awards for 4-H Clubs

The Quebec Forestry Association, the body which sponsors Junior Forestry Clubs, has announced that a number of $200 scholarships will be awarded members of the 4-H Clubs of Quebec in 1946. The awards will be made in contests for forestry craft, use of electricity, forestry security, reforestation and kindred subjects. All 3,500 members of 4-H Clubs in the province will be eligible. These clubs are rapidly expanding throughout the province, and carry on a work among the younger generation comparable to that done in farming by the 4-H Clubs of the United States, from which the Quebec clubs take their name.

1946 Pulpwood Price May Reach $15

With the lifting of various labor and other restrictions, the expectation in the industry is that the price of pulpwood will stabilize during the present year at around $14 or $15 per cord. Due to the fact that there is now a market for all that can be produced of every type of forest product, from pulp and paper and all the various varieties of lumber to plywood and shingles, the price of pulpwood now differs widely in all provinces and districts of those provinces, ranging from $11.50 per cord to $22 or even higher per cord, delivered at the mills.

Here Is *Your* Idea Of A
CONSISTENCY REGULATOR

- a Regulator that holds stock consistency to within plus or minus 0.1% at all times.
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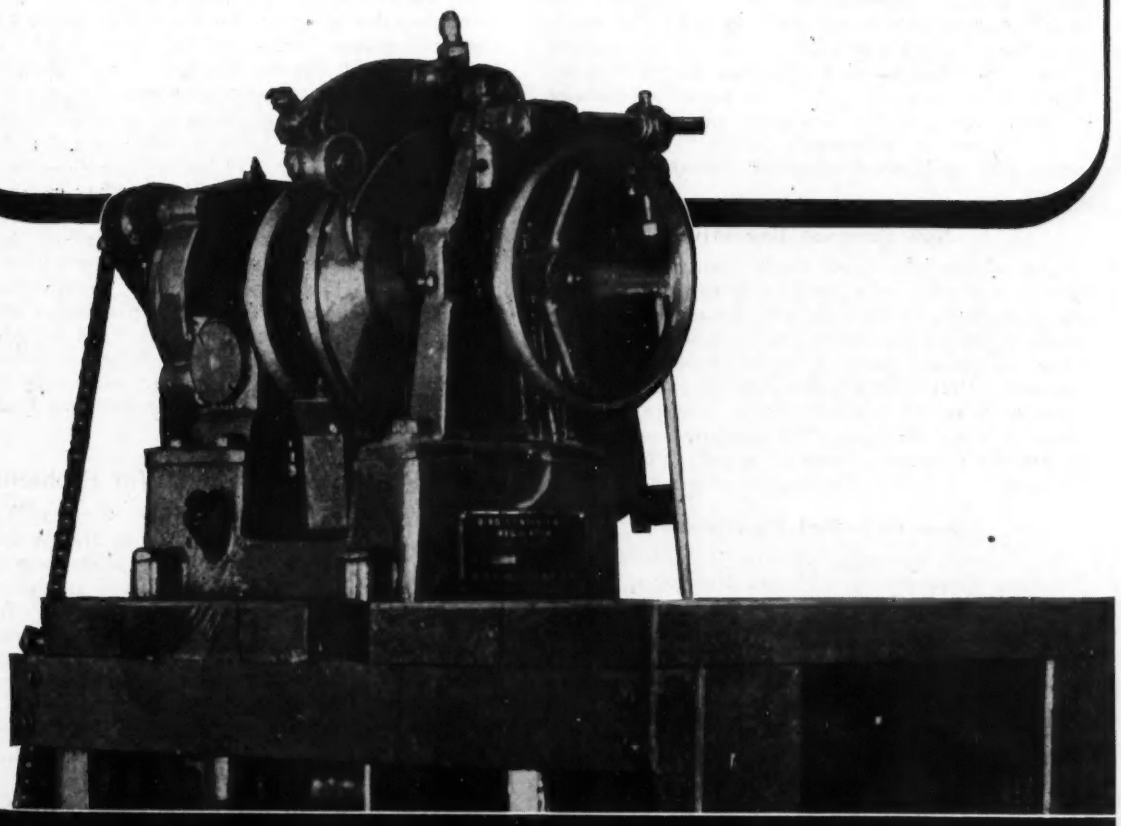

The BIRD CONSISTENCY REGULATOR

Chicago Critical of OPA Price Adjustments

Price Relief Formula To Provide Incentive For Increased Production Is Considered Unrealistic — Merchants See "Price Squeeze" If Upward Revisions Are Not Equitably Shared By Consumers.

CHICAGO, Ill., January 14, 1946—The paper market here is watching the results of some changes in maximum price regulations affecting the book paper trade. The amended regulation, while it did not grant any specific price increases to the book paper mills, did provide for a change in the differentials on sheeting paper which actually means, according to local reports, a substantial price betterment at the mill level. Chief concern here comes from the retailer of paper and, in part, the jobber, because of the fact that these upward revisions are not allowed to be represented in the selling costs of the retailer, thus intensifying the "squeeze" which is the result of the Bowls "cost-absorption" program.

The trade here feels that OPA has recognized the need for price boost or differential alterations to provide an incentive for badly needed production, but in many quarters there is marked resentment at what is termed an "unrealistic" attitude on the part of OPA with reference to refusing ultimate passage of increases onto the ultimate buyer. OPA, it is reported, has a mistaken idea of the volume necessary to live under reduced mark-ons and an erroneous idea of the paper operations of the country at the jobber and retail level. In the end, the industry believes, price rises will have to be passed on through to the ultimate buyer. Sentiment indicates that this rise will not be inflationary but will insure more production and distribution to siphon off buying power.

New Paterson Executive

One of the new titles which came in which the first of the year went to Joseph Gubbins, popular sales executive in this area, who has recently become midwest sales manager of the Paterson Parchment Paper Company. Joe Gubbins has been with Paterson since 1921 and a great deal of that time has been spent in the territory he is now planning to serve as sales manager. The company's offices are located in Chicago's "paper capitol", the Conway Building at 111 W. Washington street.

Goes to United Paperboard

J. J. Fritz, formerly with the Universal Paper Products Company of Chicago, has recently been appointed sales representative of the United Paperboard Company with headquarters in Chicago in the Engineers Building. Mr. Fritz has been intimately associated with the board industry for nearly twenty years, having been identified with both Container Corporation of America and the Union Bag and Paper Company before being with Universal. Mr. Fritz joins a sales organization headed by Harold W. Kephart, vice president in charge of sales in this area.

Straubel "Test" Meeting Successful

One of the major news items "skipped" slightly in the Christmas rush, pertains to the mid-December meeting held here by the Straubel Paper Company which attracted the attendance of merchants from all parts of the country. It was a more than ordinarily important session because it's announced major objective was to develop the type of a session that could be used for regional meetings with Straubel outlets all over the country. The Straubel "Distributors Policy" was reported as the high light of the program and designed to materially boost the interest of both maker and outlet in an intelligent sales program. Representing Straubel at the one day conference which terminated with an informal dinner were J. W. Straubel, vice president and general manager, Gordon Ware, treasurer and Joseph Weston, sales manager, who outlined the company's advertising program and policy for 1946.

Federated Mills Plans Golden Fleece

BANCROFT, Mass., January 5, 1946—The Federated Mills of this town has just completed a thorough reorganization of both marketing and production personnel. The executive branch of the company has been augmented by the acquisition of Paul Miller, formerly sales executive for the International Cellu-Cotton Products Corporation, who has joined Joseph Englander and Robert Englander in partnership, forming the Golden Fleece company.

This new company has been designed to market a facial tissue product in both box and toilet tissue form. These products will be merchandised by exclusive department and drug store outlets numbering approximately 1500 throughout the United States. The Golden Fleece name will be advertised during 1946 in six leading national magazines with Gray and Rogers of Philadelphia handling the advertising.

Robert Englander is heading the production organization, assisted by the following: Fred V. Munn, paper mill superintendent; Roy Wheeler, assistant superintendent; William Menton, converting manager; William Frisbie, traffic manager and Earl R. Clark, purchasing agent.

A.P.P.A. to Study Post-War Problems

The 69th Annual Meeting of the American Paper and Pulp Association to be held at The Waldorf-Astoria, New York, during the week beginning February 24, 1946, will concern itself in the main with post-war problems and their solution. While travel conditions may have improved somewhat by February, it is anticipated that the situation will be difficult, not only as to travel but as to accommodations in New York. The annual luncheon of the American Paper and Pulp Association will be held on Wednesday, February 27th, at 1:00 P. M.

New Morgan Plant for Charleston

CHARLESTON, S. C., Jan. 9—Morgan Brothers, of Richmond, Va., will establish a plant in Charleston to manufacture paper, cotton and burlap bags. According to George Morgan, senior partner, the plant here will employ 75 women and about 25 men.

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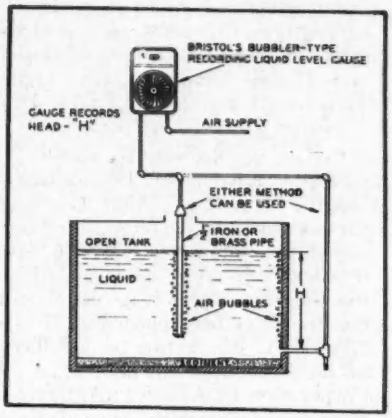
Bristol's Liquid Level Gauges accurately show and keep a permanent record of the level of any liquid — in open or closed vessels.

Float, pressure-bulb, pressure, air-bubbler, and differential type liquid level gauges are offered in all ranges of application.

Automatic Controllers in both electric and air-operated models are also available.

The diagrams show typical methods of installing liquid level gauges. Further information on Bristol Liquid Level Gauges is given in Bulletin L700. Address The Bristol Company, 148 Bristol Road, Waterbury 91, Conn. U.S.A. The Bristol Company of Canada, Ltd., Toronto, Ontario. Bristol's Instrument Co., Ltd., London N.W.10, England.



Typical Installation of Bristol's Bubbler-Type Liquid Level Gauge

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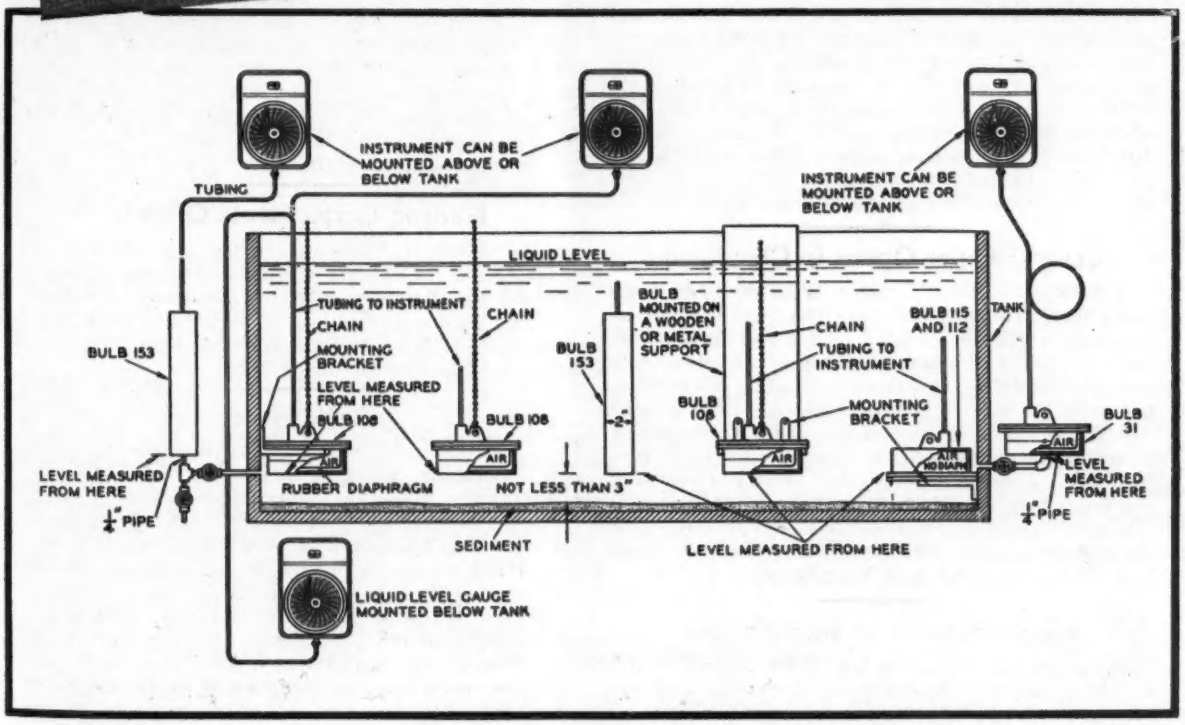

Eastern Mills Form Conservation Group

Manufacturers of paperboard, white paper and roofing materials have formed the Eastern Conservation Committee of the Waste Paper Consuming Industries to assist mills with local campaigns to stimulate the flow of waste paper through dealer and packer channels. George E. Dyke, president of Robert Gair Company, Inc., is chairman of the committee, with J. S. Miller, of the New Haven Pulp and Board Company, as secretary, and W. G. Latham, of the Fort Orange Paper Company, as treasurer.

Colley S. Baker, who was in charge of all the salvage campaigns in Pennsylvania during the war for the War Production Board and the Pennsylvania Council of Defense, has been named as director of the Committee's service. He is being assisted by Alex B. Johnson, who was WPB's associate executive secretary for salvage in New York City. Headquarters have been opened at 370 Lexington Avenue, New York. In addition to the officers, other members of the Committee include: Ira C. Koller, Container Corporation of America; Anthony Desidorio, Clifton Paperboard Company; David F. Lawless, Lawless Bros. Paper Mills, Inc.; J. E. Smith, Sr., Chesapeake Paperboard Company; F. E. Brown, Manchester Board and Paper Company; J. R. Kennedy, Federal Paper Board Company, Inc.; Earl Weaver, International Paper Company; Morgan K. Smith, Crocker, Burbank Company Association, and M. S. Hanna, Bird & Son, Inc.

Whiting Scale Automatically Raised

HOLYOKE, Mass., January 5, 1946—The 450 employes of the three Whiting paper mills have been granted pay raises and other concessions identical to those contained in the new contract signed by other local paper manufacturers and two Holyoke paper mill unions. The Whiting employes are now getting the six and seven cents hourly increases most recently agreed upon after prolonged collective bargaining between union committees and representatives of the other paper mills, including Harold T. Martin, labor adviser. Also being paid by Whiting are the three-cent hourly increase agreed upon last summer, the shift differentials, holiday pay and pay for the sixth day, all features of the new contract.

Central Paper Opens in Cleveland

MUSKEGON, Mich., January 12, 1946—The Central Paper Company, Inc. announces the opening of a new sales office in Cleveland, Ohio and the appointment of Larry Powers as manager. Cleveland had previously been serviced from the Buffalo office which primarily controls a territory composed of Northern and Western New York and the tip of Northwestern Pennsylvania. The address of the new Cleveland office is Central Paper Company, Inc., Union Commerce Building, 925 Euclid Avenue, Cleveland 14, Ohio. The newly appointed manager has been affiliated with the sales department of Central Paper Company since 1928 stationed at the New York office.

Ralph Returns to Jacksonville

JACKSONVILLE, Fla., Jan. 14, 1946—Sidney Ralph has been released from the Naval Service and has returned to take over in his former capacity as general manager of the Atlantic Bag and Paper Company.

Gair Interests Confer in Savannah

SAVANNAH, Ga., January 14, 1946—Ernest C. Rossiter, consulting engineer for Robert Gair Company, Inc., and Edward K. Bachman, New York attorney, were in Savannah last week to negotiate an agreement with the city to take a 20 per cent of the 50-million gallon daily capacity of the proposed industrial water supply system. As previously reported in PAPER TRADE JOURNAL, the Gair company proposes to locate a huge paper mill here and has taken an option from the Port Wentworth Corporation on the old McEvoy shipbuilding site on the Savannah river.

An informed source here said the industrial water supply system would cost upwards of $5,000,000. The city some months ago voted $1,000,000 in a bond issue for this purpose, and it is proposed to obtain the additional money necessary through issuance of revenue certificates. Mr. Rossiter told a local newspaper there was no information to release at this time. Mr. Bachman is a member of the firm of Rathbone, Perry, Kelly and Drye of New York, general counsel for Gair.

Lankenau Returns to Union Bag

The Union Bag and Paper Corporation has appointed Henry P. Lankenau as assistant sales promotion manager. Mr. Lankenau received his honorable discharge recently from the United States Navy after serving for two and a half years as a Pharmacist's Mate First Class with the Hospital Corps. His tour of overseas duty included active service in the Pacific at Eniwetok, the Marshall Islands and Okinawa. Before joining the Navy Mr. Lankenau was connected with the sales promotion and advertising departments of the corporation for over five years.

Plastic Corporation Adopts Taypit

MORRISTOWN, N. J., January 14, 1946—International Plastic Corporation has adopted Taypit as the new name for its retail consumer line of self-sealing transparent, colored and decorative tapes for office and household uses and for gift wrapping. The wide line of tapes made by this corporation for industrial and commercial applications will continue to be sold under the name of Filmonize.

Hudson Corp. Elects Officers

The Hudson Pulp and Paper Corporation of Maine, and the concern's Palatka, Fla. project have elected the following officers: president, Abraham Mazer; executive vice-president, Jacob Mazer; vice president, William Mazer; secretary, Sam A. Lopin; treasurer, Joseph M. Mazer.

J. V. Byrne

J. V. Byrne, 68, widely known through the paper and packaging trades as a salesman for Marathon Corporation, Menasha, Wisconsin, died suddenly in a Chicago hospital on December 17, following a heart attack. Mr. Byrne was a pioneer salesman in the paraffined carton field, and played a large part in introducing the use of paraffined cartons and waxed papers to the food processing and meat packing industries. Employed as a Chicago salesman in 1917 by the Menasha Carton Company, predecessor to Marathon, he represented the company in the Chicago area until his death, and was for several years in charge of the Chicago sales office.

Reduced chipping costs give you a basic sales advantage. For instance, Heppenstall chipper knives, over a *long* period of time and under *various* plant conditions, have shown a consistently and substantially lower unit cost than *any* other brand on the market. Matter of fact, Heppenstall *guarantees* them to do so . . . and that's why we say that one *certain* step toward a secure business future is to *insist* on the trouble- and money-saving surety of Heppenstall knives. Write for prices. Heppenstall Company, Pittsburgh, Pa.

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Loggers Promote Forest Improvement

VANCOUVER, B. C., January 14, 1946—Approximately 400 members registered for the third annual convention of the Truck Loggers Association of British Columbia in Vancouver January 10, 11 and 12. While it was the third annual convention, the organization has actually been in existence for five years, but during the first two years was not definitely set up as an association. Annual meetings for the first two years were held in Nanaimo, but as the organization was developed to include all portions of British Columbia where truck logging operations are carried on the scene of the convention moved to Vancouver.

The convention has become one of the outstanding events in the logging industry in British Columbia for while the truck loggers' operations are small compared with those of the huge logging concerns which have their headquarters in British Columbia, the cut of the truck loggers represents approximately 50 per cent of the total forest cut in the province, and numerically the association is the largest group within the logging industry.

O. A. Buck, Nanaimo, was returned to office for a second term as president of the association and A. P. Allison of Vancouver was re-elected as vice-president. Members of the Board of Directors are F. Barwell, Clarke Gibson, W. L. Keate Jr., J. W. Baikie, Chester Swanson, J. K. Clarke and C. C. Smith. Fred Adams, Nanaimo, was re-elected as secretary of the association. Thanks of the membership was expressed to Mr. Adams for the efficient manner in which he had discharged the duties of the organization since his appointment as secretary following the inception of the association.

After extensive consideration it was agreed that the offices of the association should be continued in Nanaimo for at least another year. It had been suggested at a meeting of the executive committee that the association offices should be moved to Vancouver, but Mr. Buck expressed belief that as the majority of the members were located in the Vancouver Island area where much of the logging activities of British Columbia were centered that the moving of the offices to Vancouver would constitute grave inconvenience to the members. It was agreed on the other hand, that many of the contacts which the association offices had to make were in Vancouver and that the secretary spent considerable time in Vancouver each month. It was suggested that economies could be affected by the opening of an office in Vancouver. However, the meeting decided in favor of continuing the headquarters of the association in Nanaimo.

Mayor J. W. Cornett officially opened the convention and Mr. Buck, as president, expressed appreciation of the membership to the Mayor for his opening address.

Mr. Buck reiterated the objectives of the association which were: (a) To obtain, prepare and disseminate information as to better logging and operating methods among our members. (b) To educate our members in better logging practices. (c) To assist the Forest Branch and other departments of government to carry out better logging practices. (d) To educate the general public as to the position and efforts of logging operators. (e) To assist members to co-operate among themselves for the better protection of the natural resources of the country and the interests of the operators, and to enable the members to set up the necessary machinery to assist each other with their logging and operating problems. (f) To do all things necessary and incidental to the carrying out of these objects.

Mr. Buck also pointed out that they were at present 28 pieces of federal and provincial legislation which applied to the logging industry, and stressed the fact that knowledge of each and all of these acts were necessary if the operator was to avoid running contrary to some regulation.

Development of a forestry department at the University of British Columbia received considerable discussion at convention sessions and Dr. Norman MacKenzie, president of the University, in an address at the closing banquet, stated that it was a source of gratification to him to know that the report of the Royal Commission, headed by Chief Justice Sloan, had urged such a University development. Dr. MacKenzie said that the creation of a faculty of forestry instead of a department had his endorsement. He suggested that the work of such a faculty might include the establishment of a forest ranger school; the development of an extension branch for the education of the public on the importance of the industry and the need of preventing forest fire, the training of undergraduates in forestry, the promotion of research and the utilization of timber products and the development of approximately 10,000 acres which had been given to the University for use as an experimental forestry area in the district north of Haney.

Dr. MacKenzie said the logger was the most important single factor in developing a lasting plan of management. He said in proportion to the revenue which the federal government collected from the forest industry it had spent comparatively little on it, and he suggested that the industry should make more noise at Ottawa in order to secure action by the federal government in the development of this great British Columbia industry.

The annual banquet was attended by 650 persons who were the guests of the Finning Tractor and Equipment Company Ltd. of Vancouver. A dance was held following the conclusion of Dr. MacKenzie's speech.

Earlier in the convention members were the guests of Marshall Wells (B.C.) Ltd. and Wright's Canadian Ropes Ltd. at a luncheon meeting when the Hon. H. H. Stevens was a guest speaker, taking as his topic "Foreign Trade Prospects."

Labor relations and accident prevention and safety work formed a theme of addresses at the opening afternoon session. The morning of the second day was devoted to addresses on equipment, while the entire afternoon of the second day took the form of a symposium and open forum on reforestation. Speakers at this session included Clyde Martin, Chief Forester, Weyerhaeuser Timber Company, Tacoma, Washington; Professor J. E. Lierch, B. A., B.A.Sso., University of British Columbia; C. C. Ternan, Assistant Chief Forester, Department of Forestry, B. C. Government; and Ian C. McQueen. In addition to these speakers those participating in the open forum were H. R. MacMillan, O. B. E., head of the MacMillan Export Company; F. D. Mulholland, D.F.; A. P. MacBean, F. S. MacKinnon, J. E. Mottishaw and F. H. J. Hodgins.

Following the conclusion of the convention members were again the guests of the Finning Tractor Company at a reception in their show rooms.

INTERESTING FACTS ABOUT PAPER

A new book paper, originated by a British firm, has an unusual property—the pages repel each other and pop up fan-wise when pressure on the top page is released, to facilitate turning. The paper is 30 per cent lighter and thinner than Oxford India.

INTERESTING FACTS ABOUT A BASIC COLOR

METHYL VIOLET 4PBX Conc. is the outstanding member of the Basic Violets. It is by far the most economical and useful violet used in paper dyeing.

Used in conjunction with Methylene Blue 2B Conc. and Green MX Conc., it produces light and deep blues and violets. With Fuchsine RTN it produces the deep, rich, red-violet tones. It is also used extensively for tinting news whites. Because of its excellent solubility, it is well-adapted for staining, continuous coloring and coating.

Your Heller & Merz representative can give you complete details on Methyl Violet 4PBX Conc.

B-M-T Sets Up Pension Plan

Establishment by Blake, Moffitt & Towne of a retirement plan for the benefit of all employes having a record of five years or more of service has just been made public by James K. Moffitt, president of the pioneer paper firm. "It is a happy augury," Mr. Moffitt said, "that the Company celebrates this year its ninetieth anniversary, and that at all times the loyalty and cooperation of its employes have been important factors in its success."

The pension plan which became effective on December 31, 1943, is in keeping with the modern trend, taking into account, as it does, the old-age benefits payable under the Federal Social Security Act. Its adoption will necessitate a very considerable initial and annual outlay by the Company, which assumes payment of the entire cost of providing annuities for past service and the greater part of the cost of future service annuities. The amount guaranteed under the Company plan, when added to the basic federal benefits, will result in a total income sufficient to provide the necessities of life at the age of retirement.

To safeguard the successful operation of the plan and the future payments of retirement annuities, a contract has been entered into by the Company with The Equitable Life Assurance Society of the United States, which has administered for nearly thirty years past the Group Life Insurance Plan of the Company.

All employes having the necessary five years of service required for eligibility were given an opportunity to become participants. Proof of their enthusiastic acceptance of the plan was evidenced immediately after it was announced. Every eligible employee in all sixteen of the Company's divisions elected to become a participant—a 100% acceptance.

Glatfelter Continues Improvements

PHILADELPHIA, Pa., January 14, 1946—P. H. Glatfelter Company, Spring Grove, Pa., is making plans for extensive improvements and installations. Included in the plan of the Glatfelter company, which has rounded out eighty-one years in paper manufacture, is the remodeling and enlarging of the pulp mill, that had been under way but because of the war was delayed. Besides a new bleach-making plant now is in operation, an entirely new evaporator installation for soda recovery is in the stage of completion, and extensive developments in water storage and water filtering are about finished.

Driving capacity on a number of machines has been increased and surface-sizing equipment have been installed in the paper-making department. The Company also announces the erection of a large up-to-date laboratory for process and research work.

S.N.P.A. Plans Support of Expansion

CHATTANOOGA, Tenn., January 12, 1946—The newsprint mills committee of the Southern Newspaper Publishers Association, will meet in Atlanta on Saturday, January 26, to plan for S.N.P.A.'s support of expansion of newsprint production in the South Clarence B. Hanson, publisher of the Birmingham News-Age Herald, is chairman of the newsprint mills committee. The latter will report on its plans to the association's board of directors.

George Biggers, general manager of the Atlanta Journal, will preside as chairman of the board in sessions Sunday and Monday, January 27 and 28.

Diamond Expands Sales Organization

Diamond Alkali Sales Corporation has taken over the operation of the Baltimore and Boston branches of Sunshine Soda Company. The Baltimore branch will be merged with Diamond's Philadelphia district office located at 12 South 12th Street, of which C. F. Wolters, Jr. is manager. H. A. Kurtz and A. DePhillips, former Sunshine Soda representatives in the Baltimore area, will continue to supply local service from Baltimore and Washington warehouses.

In Boston a new Diamond Alkali Sales office has been established to take over the operation of the former Sunshine Soda branch in that city. The owners are located at 80 Federal Street. H. B. Clark, formerly associated with Diamond's New York sales organization, will serve as Boston branch sales manager.

Diamond Alkali Sales Corporation also announces the appointment of R. B. Perry as district sales manager of the Memphis office. Mr. Perry has been associated with the Diamond organization for some years, and was recently released from service in the Navy, where he served as lieutenant in various combat areas. He succeeds E. A. Jones, who has opened a chemical and laundry supply business in Little Rock, Ark., distributing, among other products, Diamond Alkalies.

C. I. Brinkerhoff, formerly associated with the Memphis office of Diamond, will take up new duties with the Benner Chemical Company, Chicago, distributors of Diamond Alkali products in the Middle West.

N. C. Pulp Reopens After Overhaul

PLYMOUTH, N. C., January 14, 1946—Operations were resumed by the North Carolina Pulp Company here last Friday morning after a 10-day suspension during which the machinery in the $8,000,000 plant was overhauled and craftsmen of every sort worked overtime on the installation of new equipment. Officials said the latter will, by the end of the year, considerably expand the plant's output and extend its operation into the completed product field when a massive board machine, most modern and among the largest of its kind in the world is installed.

A company spokesman said that continuous operation of the plant appeared today somewhat doubtful for the present because of the acute shortage of cordwood and the continued uncertainty of weather conditions for the next several weeks. However, Resident Manager D. B. Kuhe and other officials said they were hopeful that "some sort of a meterological miracle will happen and we can get a continuing flow of some of the 35,100 cords of wood now cut and ready to be moved to the plant here."

Quaker Paper Trade Dines

On Tuesday last the Philadelphia Paper Trade Association held its annual meeting with a reception and dinner at the Warwick Hotel at 6:30 P.M. A novel feature of the dinner was the news broadcast by Lowell Thomas direct from the dinner. The outstanding address was made by E. W. Tinker, executive secretary, American Pulp and Paper Association.

T. H. B. Smythe, president of J. L. N. Smythe Co., has welcomed return of Lt. Commander I. R. Richards, to the sales force of fine paper department, after four and one-half years in the United States Navy. Martin Pedersen, Y-1/c, United States Navy is also back again in the fine paper department, and soon will be calling on the trade.

Ohio TAPPI Discusses Stream Improvement

The Ohio Section of the Technical Association of the Pulp and Paper Industry met at the Manchester Hotel on January 10, 1946 to discuss "Stream Improvement." H. H. Lattimer, of Champion Paper & Fibre Co., Hamilton, Ohio, presided and introduced F. H. Waring, Chief Engineer of State Board of Health and Secretary of the Ohio River Valley Compact Commission, Edward Bearce, Chillicothe Paper Co., member of National Council of Stream Improvement, and Herbert Randall, Champion Paper & Fibre Co., Chairman of Water Conservation for the Hamilton, Ohio area.

Mr. Waring detailed the history and aims of the Ohio River Valley Compact Commission and explained the Ohio River Valley Water Sanitation Compact between the states of Illinois, Indiana, Kentucky, New York, Ohio, Pennsylvania, Tennessee and West Virginia, made into an act by the 76th Congress and approved under certain conditions of ratification July 11, 1940. This act has now been ratified by all of the above states and awaits only the ratification of Virginia whose consent is necessary before the law can be put into full effect. However, two states, Pennsylvania and Ohio have already ordered industry to ready plans for non-pollution of streams. Mr. Waring sketched the history of stream improvement, outlining the necessity for removal of those contaminations destroying the oxygen in the stream. He also outlined the plans formulated for financing the work by municipality and industry, and provisions made for this in other bills. After ratification it will be mandatory, within a reasonable time, for industry to plan, construct and put into-effect works for the treatment of sewage and industrial waste to that extent which may be necessary to maintain such waters in a sanitary and satisfactory condition, at least equal to the condition of the waters of the interstate stream (Ohio River) immediately above the confluence. This, of course, means all streams flowing into the Ohio River. Not less than 45% of the total suspended solids shall be removed, as well as complete removal of settleable solids, provided however that in specific instances a higher degree of treatment may be mandatory. Mr. Randall challenged this statement, pointing out the possibility of an unfavorable ruling against one or more of a group within competitive industries. Mr. Waring was of the opinion, however, that in such case the rulings would be uniform for an industry, but not uniform among competitive industries. Mr. Bearce explained the purpose and functions of the National Council of Stream Improvement, of which he is a member, and pointed out the establishment of pilot plans in Kalamazoo, Michigan, Mellon Institute, Institute of Paper Chemistry and other points for complete study of wastes affecting the paper industry

Those present included: Jas. J. Anders, M. L. Barker, E. F. Bearce, M. Ed Beatty, R. L. Betts, W. H. Boast, C. E. Brandon, John E. Burdsall, Jack Bustle, C. H. Butterfield, Phil Cade, H. J. Esswan, W. W. Galloway, D. J. Goodman, H. H. Harrison, H. L. Haworth, E. W. Heilman, G. A. Hermann, S. Hluchan, J. A. Hoerner, Walter Holzberger, J. W. Jelks, Edward Johnson, Albert Kind, Harold Koch, Homer Lattimer, Edward Lum, Kon Matchuk, R. D. McCarron, S. R. Olsen, Dave Patrick, H. Randall, L. R. Randall, T. G. Rawling, Wm. Reigers, J. T. Rice, C. W. Richards, E. A. Rinell, Doublas Robbins, Carl Roess, Frank A. Root, Harold Ruby, Paul Schaffrath, Paul Schreiber, E. J. Schrorer, R. S. S. Shoemaker, R. Silver, J. R. Simpson, W. C. Slattery, R. H. T. Smith, W. J. Stinson, G. H. Suhs, J. R. Sutfin, Arba Thomas, Art Thurn, G. H. Waring, Robert R. Weber, Jim Wellman, W. L. Wiltse, F. L. Zellars, G. A. Zinkil.

TAPPI and Superintendents Meet at Kalamazoo

The joint meeting of the Kalamazoo Valley Section of the Technical Association of the Pulp and Paper Industry and the Michigan division of the American Pulp and Paper Mill Superintendents Association met on Thursday, January 10th in Kalamazoo at the Park American Hotel with 325 in attendance.

The meeting was opened by the chairman of the Superintendents Division, Ralph Atkins of the Lee Paper Company, who introduced the toastmaster, Frank French, president of the French Paper Company, Niles, Mich. Before introducing the speaker French presented the group at the speaker's table. These included Messrs. C. F. Sisson, MacSimBar Paper Company, Glenn Graham and L. W. Sutherland, Sutherland Paper Company, Dwight Stocker, Michigan Paper Company, George Gerpheide, Hawthorne Paper Company, Maxwell D. Bardeen, Lee Paper Co., C. W. Smith, Central Paper Co., Muskegon, Harry Bradford, Rex Paper Co., Ray Barton, Michigan Paper Co., and president for the second term of the Superintendents Association, and James A. Wise, Kalamazoo Paper Co., and member of the national executive committee of TAPPI. Barton and Wise spoke briefly in behalf of the organizations they represent. Both stated that the national conventions prevented during the war years, were to be resumed in 1946.

The principal speaker of the evening was Otto Kress, Technical Director of the Institute of Paper Chemistry, Appleton, Wis. Dr. Kress spoke informally of his trip to Europe during 1944. When he went to Europe in January of 1944 the army demand for paper made necessary either operation of Europe's mills or heavy tonnage demands on American shipping to supply the need.

A survey of the French industry revealed, he said, that it could not supply the need because of a lack of coal, importation of which was impossible because of lack of transportation. Turning then to Belgium it was possible because of the nearby coal supplies and the fine cooperation of the Belgians, to get some of the mills there going.

Dr. Kress then discussed the occupied portion of Germany. There, he said, he was amazed to find huge stocks of both raw materials and finished products. Some of the German mill directors were most helpful in pridefully pointing out their stocks in storage. They were equally amazed when Dr. Kress' work gangs began the next day to load these supplies and haul them into France for processing.

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But *not* way below it in *strength!*

There's a definite reason for this combination of great strength and light weight in Taylor Spiral Pipe. Its spiral seam gives it greater bursting strength, greater collapsing strength, greater longitudinal stiffness than even a seamless pipe of equal wall thickness—makes it the strongest type of pipe of its weight—enables it to handle services like those listed below with strength and service life to spare.

Go over this list and you will find that it represents the big bracket of pipe uses—the every day moderate and low pressure services that are ordinarily assigned to Standard Thickness pipe. And make no mistake about it: Going to Taylor Spiral for such applications can cut the installed cost of piping in many cases to half that of the Standard Thickness pipe it so adequately replaces.

Switching to Taylor Spiral Pipe for services like those listed is made easy by the complete range of sizes, wall thicknesses and fittings. Thicknesses range from 18 to 6 gauge; sizes from 4" to 42"; joint lengths up to 40 ft. All types of end joints and couplings, all kinds of fittings and specials or fabricated assemblies, are produced by Taylor Forge providing a complete service with undivided responsibility.

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Canadian Program Is Full of Interest

General and special sessions of the Technical Section of the Canadian Pulp and Paper Association promise to hold much of interest for every branch of the paper industry this year. The meeting, expanded to three days, takes on much of the characteristics of the circus with general sessions in parallel meetings for the first day and with group discussions following each other on the second day. The meetings begin on January 23 in the morning and close at the end of the afternoon on January 25. The program follows:

Wednesday, January 23

Session "A," Ball Room—9:45 a.m.
Chairmen, C. D. Jentz, A. J. Philip

1. The Hamilton Tubular Sulphur Melter—G. G. Vincent, Canadian Industries Ltd.
2. The Use of Absorption Towers for the Recovery of Low Pressure Relief in Sulphite Pulping—A. Hellstrom, Fraser Companies Ltd.
3. A Survey of Pulping Variables in the Sulphite Process (by title)—F. H. Yorston and T. R. Moore, Members of Sulphite Committee.
4. A Review of Alkaline Pulping in Canadian Mills —G. Allo, Bathurst Power & Paper Co. Ltd.
5. The Bleaching of Sulphate Pulp—Dr. J. N. Swartz, Howard Smith Paper Mills Ltd.

Session "B," Convention Room—9:45 a.m.
Chairman, E. J. Calnan

1. The Storage of Coal—M. O. Neilson, Consulting Engineer.
2. Recent Developments in Bark Burning Methods —R. A. Hanright, Consulting Engineer.
3. The Chemical Composition of Wood Bark—G. H. Seagall and Dr. C. B. Purves, McGill University.
4. Heat Conservation by the Use of Heat Pumps— E. Simpson, Consulting Engineer.

Session "C," Ball Room—2:00 p.m.
Chairmen, W. H. Birchard, R. J. Askin

1. Conversion of Wood Waste to Usable Fibre with the Bauer Refiner—D. H. Kincaid, Donnacona Paper Co. Ltd.
2. Function of the Pulpstone Grinding Surface— I. H. Andrews, S. A. Collicutt, R. C. Bledsoe, Powell River Co. Ltd.
3. Stock Chest Agitation—J. J. Keon, Wm. Kennedy & Sons.
4. The Drying of Paperboard—A. E. Montgomery, J. O. Ross Engineering.

Session "D," Convention Room—2:00 p.m.
Chairman, A. E. H. Fair

1. Studies of Rosin Sizing: a. The Use of Sulphuric Acid in Sizing—D. Price and D. D. Cameron, Hercules Powder Co.
2. A Stain for the Identification of Bleached Sulphite and Bleached Sulphate Fibres—F. W. Stocker and L. G. Durant, The E. B. Eddy Company.
3. Rapid Measurement of an Index of Fibre Length: a. Description of the Test Method; b. Uses and Applications of Fibre Length Index—Dr. R. de Montigny and P. Zborowski, Rolland Paper Company.
4. Investigation of the Permanganate Number—R. Bourgon, Consolidated Paper Corp.

Thursday, January 24

Highlight Session—Ball Room—10:00 a.m.
Chairman, Dr. A. C. Hill

A Panel Discussion of European Developments in Pulp and Paper Manufacture During the War Years. This discussion will be led by members of the Technical Section who have recently visited the continent of Europe. Each member of the Panel will introduce his particular field of pulp and paper technology with a brief talk.

12:30 p.m. Technical Section Business Luncheon—Normandie Roof

Group Discussions—2:30 p.m.

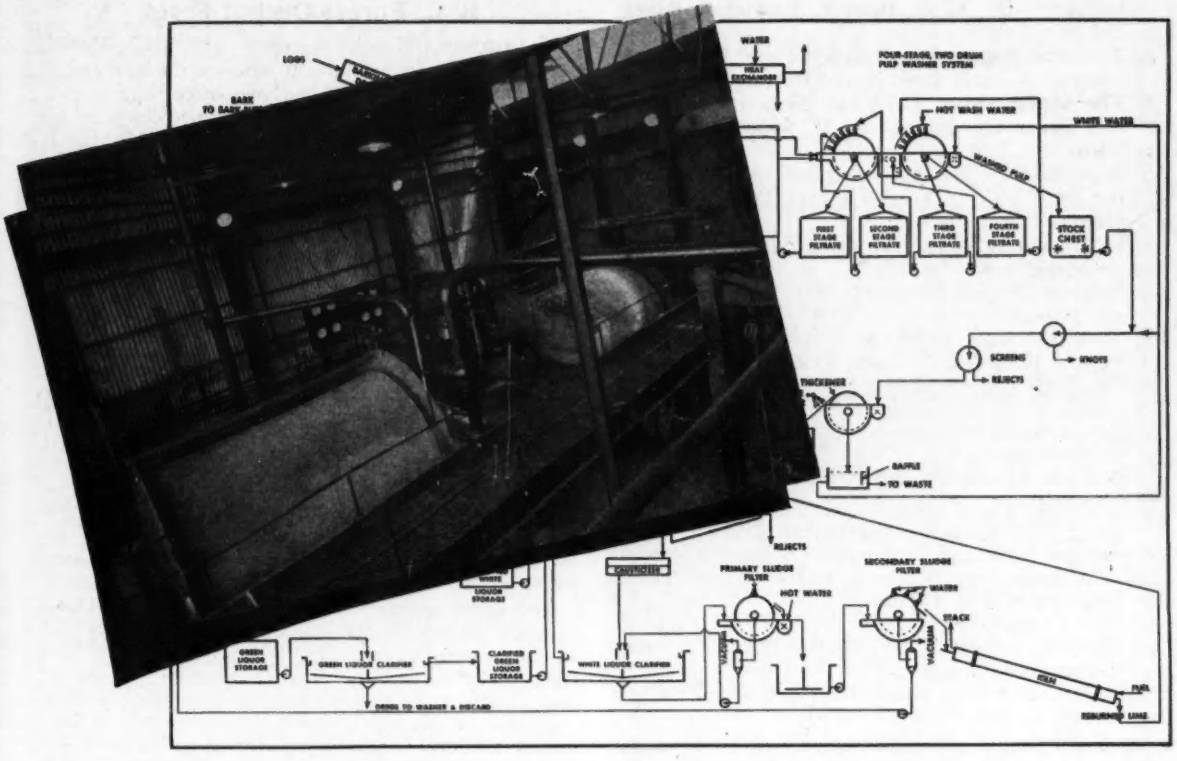
1. SULPHITE (Convention Room)
   (a) The Use of Vortraps for Removal of Dirt from Sulphite Pulp—Introduced by short talk by J. Foster, Anglo-Newfoundland Development Co. Ltd.
   (b) Jonsson Screens as Sulphite Knotters—Introduced by short talk by F. J. Lang, Dexter Sulphite Co.
   (c) Sulphite Yield from Wood—Report of John Evans, member of Sulphite Committee.
   (d) The Use of Flakt Driers for Sulphite—Led by Dr. J. N. Swartz, Howard Smith Paper Mills and I. H. Andrews, Powell River Co. Ltd.
2. WASTE (Salon "A")
   Review of Committee work on the Utilization of Wood Waste in the Pulp and Paper Industry.
3. PRINTABILITY (Salon "E")
   Printing Problems
   (a) Talk by A. E. Aitken, Bryant Press.
   (b) Discussion of Dr. W. Boyd Campbell's theory of Oil Absorption by Paper.
4. BOARD (Ball Room—North End)
   The Sizing of Paperboard.
5. HEAT AND POWER (Salons "C" and "D")
   (a) Briner Economizer Maintenance—J. T. MacDonald, Hinde & Dauch Paper Co.
   (b) A Study of Stoker Fuel Beds—A talk and technicolor film by Otto de Lorenzi, Combustion Engineering.
6. WOOD CHEMISTRY (Salon "B")
   Chemistry of Pulp Fibres
   (a) A review of the Cellulose-Water Relationship and Pulp Beating Theories—H. B. Marshall, Ontario Research Foundation.
   (b) Relationship of Chemical Composition of Pulp Fibres to their Paper Making Properties— J. McK. Limerick, Bathurst Power & Paper Co. Ltd., and A. J. Corey, Fraser Companies Ltd.
   (c) A Critical Review of the Relation of Sheet Properties and Fibre Properties in Paper—C. C. Heritage, Wood Conversion Co.
7. GROUNDWOOD (Ball Room—South End)
   Discussion of Mill Problems

5:00 p.m. Technical Section Council Meeting

Friday, January 25

Session "E," Ball Room—9:30 a.m.
Chairman, W. H. Birchard

1. Trends in Indusrtial Relations—Prof. J. C. Cameron, Queen's University.
2. Observations of a Paper Man in the Chemical



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Industry—Dr. G. I. Hoover, Provincial Paper Ltd.

3. Technical Approach to Pulp and Paper Mill Slime Control—J. A. Holmes, National Aluminate Corp.
4. The Application of Radio and Electronics to Pulp and Paper Operations—K. R. Swinton, R.C.A. Victor Co. Ltd.
5. Wartime Papermaking in England and its Lessons for the Post-War Years—Trevor Potts, Imperial Chemical Industries.

The following papers read at the Summer Meeting are presented here "by title."

6. Sulphur Dioxide Recovery—J. C. Benny, Gaspesia Sulphite Co.
7. Some Practical Aspects of Sulphite Pulp Bleaching (by title)—C. T. Clark, Restigouche Co., Ltd.
8. The Zinc Hydro-sulphite Treatment of Groundwood—I. H. Andrews, Powell River Co. Ltd.
9. Brown Stock Washing—J. R. W. Grieve, Brown Corporation.

9:30 a.m. Group Discussion Convention Room

ALKALINE PULPING

(a) Scandinavian Development in Alkaline Pulping and Bleaching Technique. (Some of the men who have recently been in the Scandinavian countries will be present.)

(b) Progress Report on the Alkaline Pulping Research Project at the Pulp and Paper Research Institute of Canada—Dr. J. H. Ross.

12:30 p.m. Annual Luncheon—Canadian Pulp and Paper Association

Friday, January 25—2:30 p.m.—Group Discussions

1. BOARD (Ball Room—North End)
   (a) Sulphite for Board—Introduced with a talk by C. S. V. Hawkings, Price Bros. & Co. Ltd.
   (b) Discussion of General Questions.
2. ENGINEERING (Salons "C" and "D")
   (a) Stock Chest Agitation.
   (b) Gadgets Submitted for the Pulp and Paper Magazine of Canada competition.
   (c) The Work of the Engineering Committee on the Text book Revision.
3. FINE PAPERS (Salon "A")
   (a) Suction Presses.
   (b) Sizing.
   (c) Stock Preparation Control.
4. SULPHITE SUB-COMMITTEE ON BLEACHING (Salon "B")
   Bleaching with special reference to the questionnaire being prepared on this subject.
5. GROUNDWOOD (Convention Room)
   Discussion of the Questions and Problems submitted by the mills.
6. WOOD CHEMISTRY (Salon "E")
   Recent European Developments in Wood Chemistry. (Dr. A. C. Hill and some of the other technical men who have visited Europe recently will be present to take part in the discussion.)

Fowler to Head Newsprint of Canada

MONTREAL, P. O., January 11, 1946—Charles Vining, president of the Newsprint Association of Canada since 1934, will become chairman of the Executive Committee and will be succeeded as president by R. M. Fowler, who is also president of Canadian Pulp and Paper Association. Mr. Vining, as chairman, will remain active in newsprint affairs. Mr. Fowler's position as president of the two associations will provide for integrated representation of the pulp and paper industry as a whole.

B. C. Forest Output Rises

VANCOUVER, B. C., January 14, 1946—British Columbia's forest production will see an increase of approximately $4,000,000 last year, according to preliminary estimates which have been prepared by his department as submitted by the Honorable E. T. Kenney, Minister of Lands and Forests. Higher prices prevailing for pulp, poles, and other forest products have combined with increaesd production to step up the total value of the forest industries of the province. The preliminary estimate places this valuation at more than $150,000,000, as compared with $146,600,000 for 1944.

Log scale for 11 months is 2,700,000,000 f.b.m., compared with 2,677,000,000, last year. Lineal foot scale is 29,306,000, compared with 17,690,000. Cordwood output dropped from 198,000 cords to 111,000 cords, largely due to the fuel shortage being overcome and the demand for cordwood being reduced. Higher prices for hewn ties resulted in increase of production from 462,000 to 518,000 ties.

Owing to price ceilings the value of major products was held to comparative levels with 1944, but the overall picture improved and resulted in a general increase.

The labor situation improved considerably. Operation of the power saw school at Nanaimo has been an outstanding success. Every man qualified has been taken up by the industry. Operators are replacing old time fallers and buckers, and are increasing output.

Excess of demand over supply is expected to keep production levels high during 1946. In addition to the Dominion-sponsored campaign for 70,000 to 75,000 houses a year for the next five years, keen demand from the United Kingdom, continental Europe and the United States is expected to continue. The war made heavy inroads on European supplies, almost everything cut going into military use, while civilian markets were starved. Reconstruction will require great quantities of lumber.

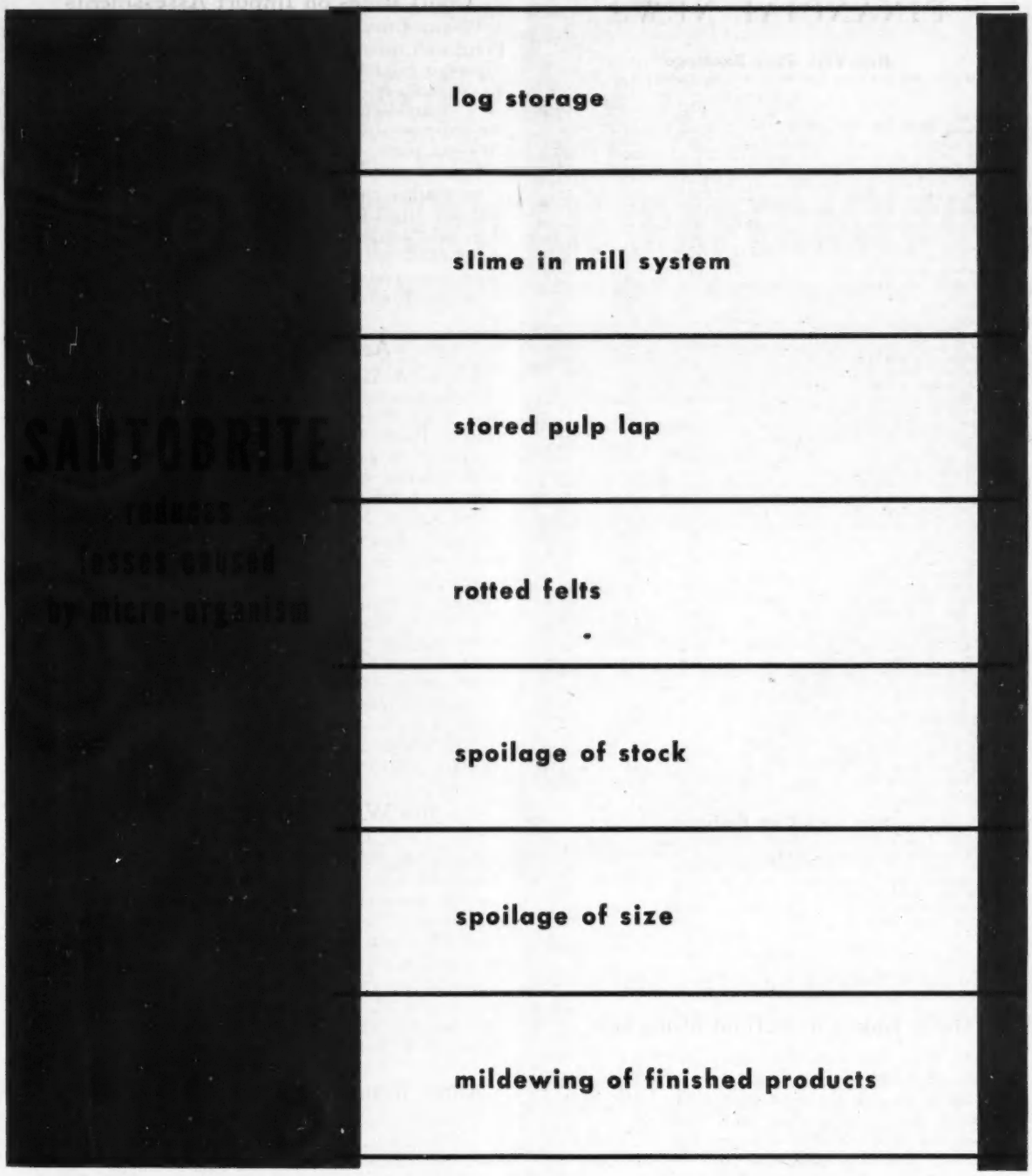
Ontario Battles the Beetles

SAULT STE. MARIE, Ont., January 11, 1946—One of the newest outposts of Canada's relentless war on beetles is the Entomological Laboratory being erected here, at a cost in excess of $300,000, for the Ontario Department of Lands and Forests. It is hoped the building may be completed and equipped and ready for use early in June this year. The building under construction is 150 x 50 feet, with a wing on one end. The experimental section is being encased in reinforced concrete to prevent insects liberated by accident from boring their way into the building's timber work and reaching the open.

Huge losses have been incurred by lessees of timber limits in Ontario due to the inroads of tree-killing insects. One company in Northern Ontario is said to have written off $250,000 when it found trees on some of the land it had leased were useless. Insect infestation has often got far ahead before discovery, but today there is a small army of entomological observers working from outposts in Quebec and Ontario.

Wood Scaling System Changed

The Quebec Government has passed an order-in-council changing the scaling system of wood cut in the province from the board to the cubic foot measurement.



Mill experience has proved that serious losses due to micro-biological activity can be reduced with Santobrite*—Monsanto's sodium salt of pentachlorophenol. It is chemically stable, non-corrosive to metals, non-volatile and comparatively odorless. Initial cost is low and suggested applications are economical, because no expensive apparatus is required. Complete information on the scientific and effective control of micro-organisms in the various trouble zones in pulp and paper mills is contained in Monsanto's Bulletin O-5, "Santobrite for Micro-organism Control in the Pulp and Paper Industry." Send for your copy. Address: MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1700 South Second Street, St. Louis 4, Missouri. *Reg. U. S. Pat. Off.*

MONSANTO CHEMICALS
SERVING INDUSTRY...WHICH SERVES MANKIND

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending January 12, 1946

STOCKS

	High	Low	Last
A. P. W.	8⅜	7¾	8⅛
Armstrong Cork Co.	59¾	55⅞	59
Celotex Corp.	25	22⅝	24⅜
Celotex Corp., pf.	21¼	20⅛	21
Certain-Teed Products Corp.	16½	14¾	15⅞
Certain-Teed Products Corp., pf.	119¾	115	115
Champion Paper & Fibre Co.	51	51	51
Champion Paper & Fibre Co., pf.	113	113	113
Congoleum Nairn Co.	36¼	34	35⅛
Container Corp. of America	40	37	39⅜
Continental-Diamond Fibre Co.	16⅜	15⅝	16⅛
Crown-Zellerbach Co.	31¼	30	30⅜
Crown-Zellerbach Co., pf.	109	107¾	108¾
Dixie Cup Co.	50	47	50
Dixie Cup Co.—A	55	53½	54½
Flintkote Co.	39⅜	36⅜	38⅛
Flintkote Co., pf.	...	...	...
Robert Gair	10⅛	9⅛	9⅞
Robert Gair, pf.	19⅝	19⅛	19½
International Paper Co.	47⅜	44½	44⅝
International Paper Co., pf.	119	116	117
Johns-Manville Corp.	148	141	146¼
Johns-Manville Corp., pf.	140½	138	140½
Kimberly Clark Corp.	67½	67	67½
Mac Andrews & Forbes	40⅝	40	40½
Mac Andrews & Forbes, pf.	157	157	157
Masonite Corp.	62¾	58½	60
Mead Corp.	23½	21	23½
Mead Corp., pf. A—6%	106	105	106
Mead Corp., pf. B—5½%	106⅛	105	106
National Container Corp.	30	27¼	29
Paraffine Companies, Inc.	81¼	78¾	81
Paraffine Companies, Inc., pf.	108½	108½	108½
Rayonier, Inc.	24	22¾	23⅛
Rayonier, Inc., pf.	38	37¾	37⅞
Ruberoid Co.	46	44¾	46
Scott Paper Co.	58	57	57
Scott Paper Co., pf.	113½	110	110
Sutherland Paper Co.	39¼	39	39¼
Union Bag & Paper Corp.	26½	23½	25
United Paperboard Co.	12½	11⅝	12⅛
U. S. Gypsum Co.	112¾	109½	•111½
U. S. Gypsum Co., pf.	199¼	199	199
West Virginia Pulp & Paper Co.	39⅜	36½	39⅝
West Virginia Pulp & Paper Co., pf.	113½	112½	113½

BONDS

Abitibi Pulp & Paper Co. 5s '53	107	105½	105½
Celotex Corp. 3¾s '55	...	...	...
Certain-Teed Products Corp. 5½s '53	...	...	...
Champion Paper & Fibre Co. 3s '65	...	...	...
International Paper Co. 6s '55	107½	107	107
International Paper Co. 5s '47	103⅛	103⅛	103⅛
Mead Corp. 3½s '53	...	...	...

New York Curb Exchange

High, Low and Last for Week Ending January 12, 1946

STOCKS

	High	Low	Last
Great Northern Paper Co.	45	42¾	45
Hummel-Ross Fibre Corp.	14	13	13¼
St. Regis Paper Co.	11⅜	10⅜	11
St. Regis Paper Co., pf.	...	...	...
Taggart Corp.	10⅛	9¼	10⅛

BONDS

American Writing Paper Co. 6s '61	103¼	103	103¼

Great Lakes to Refund Mortgage

FORT WILLIAM, Ont., January 12, 1946—Dividend arrears on Great Lakes Paper Co. preferred stock will not be paid in the near future, W. Earle Rowe, president, disclosed in reply to rumors of an early clearing off of the $11 of arrears. But the future is promising and this obligation will be met out of future earnings, Mr. Rowe added. The president announced that plans are under consideration for refunding the first mortgage sinking fund 5's, due in 1955. The amount outstanding is about $4,800,000. Details of the refunding arrangements are still to be decided.

Bailey Vetoes Pulpwood Tax

JACKSON, Miss., January 12, 1946—The House of Representatives received from Governor Thomas L. Bailey a message that he had vetoed a bill left over from the 1945 session which would levy a three-cent per cord tax on pulpwood.

Court Rules on Import Assessments

WASHINGTON, D. C., January 14, 1946—The U. S. Court of Customs and Patent Appeals has sustained a protest by Fibre Making Processes, Inc., against an assessment of a shipment of a heat exchanger as a "manufacture of metal." The court held with the importer that the article was properly dutiable at 20% as parts of pulp-making machinery, and not 45% as a manufacture of metal.

In another opinion of the court, an assessment of 30% on disks of filtering paper was reduced to 2½ cents per pound and 7½% as filtering paper valued at 75 cents per pound. The larger assessment was based on a finding that the shipment was "paper cut or stamped into designs or shapes."

Arabol Shares Profits

William A. Weaver, President of The Arabol Mfg. Co., manufacturers of adhesives with factories in New York, Chicago and San Francisco, announced today a Profit Sharing Plan for all employes. It is retroactive to January 1, 1945. The Chase National Bank is acting as Trustee for the Profit Sharing Plan Trust on behalf of the employes.

The Arabol Mfg. Co. will contribute 25% of its "income" after deduction of all expenses except the contribution to the Trust and except income and excess profits taxes, provided however, that the contribution in respect of any one year shall not exceed 15% of the aggregate compensation of the members in the year in respect of which such contribution is made. The amount contributed by the company, to the extent outlined in the plan, is allocated to the accounts of members entitled thereto on a basis defined in the plan. Severance of employment, disability, retirement, death and method of distribution of benefits are thoroughly explained in a release to each employe.

Jim Wilt With Brown-Bridge

TROY, Ohio, January 12, 1946—The Brown-Bridge Mills, Incorporated has appointed 1st Lt. James P. Wilt to the Chicago office. He will assist Hugh Blair, Chicago manager. Lt. Wilt is a native of Troy, Ohio and attended the University of Cincinnati and New York University, leaving in February 1941 to enter military service. He completed Air Corps Pilot training and after various assignments in the States flew in November 1943 via South America and Africa to England, where he was attached to a Troop Carrier Squadron as a C-47 Pilot.

Adair Joins Star Electric Motor Staff

BLOOMFIELD, N. J., January 14, 1946—James Adair for the last nine years a sales engineer in the Newark office of Westinghouse Electric Corporation, has joined the Star Electric Motor Co., to represent that company in the New Jersey industrial area. Mr. Adair came to this country from Belfast, Ireland, to enter Rochester Institute of Technology.

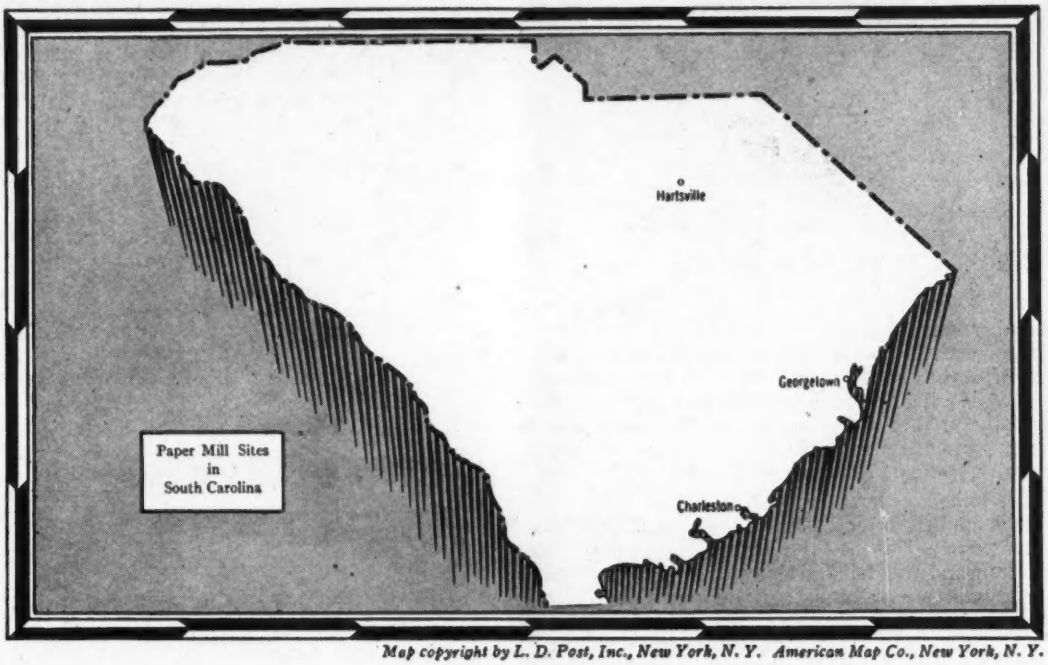
Catharin Advises Veterans

BOSTON, Mass., January 14, 1946—Norman R. Catharin, sales promotion manager, Stone & Forsyth Company, wrapping paper and twine dealers, gave an address at the New England Sales Management Conference, sponsored by the Boston Chamber of Commerce, January 12. His subject was "Selling as a Career for the Veteran."

Draper's

ATLAS OF AMERICAN PAPERMAKING

No. 12 PUBLISHED BY DRAPER BROTHERS COMPANY • CANTON, MASSACHUSETTS



Map copyright by L. D. Post, Inc., New York, N. Y. American Map Co., New York, N. Y.

HIGH LIGHTS: South Carolina makes no claim to being a leading papermaking State. Even the date of its first establishment remains a matter of speculation. In the *Chronology of Paper* included in Dard Hunter's latest book, *Papermaking* (1943), we find it stated "The earliest paper mill of South Carolina was probably not established before 1810." Week's *History of Paper Manufacturing in the United States* has nothing whatever to say about South Carolina. Perhaps some native historian hearing of this dearth of information may come forward with more facts.

There are, however, two important paper mills which should be mentioned. The property of the West Virginia Pulp & Paper Company at Charleston has a rated capacity of 400 tons daily of kraft wrapping and container board. The Southern Kraft Division of the International Paper Company at Georgetown, with a rated capacity of 1450 tons daily, makes liner board, corrugating board and unbleached pulp. A third concern making products for consumption by the owners is the Sonoco Products Company at Hartsville, and its Carolina Fibre Division.

Of interest to the paper industry is the fact that much of the best domestic clay used for papermaking is mined in the State of South Carolina.

Draper Felts for Efficiency

DRAPER BROTHERS COMPANY

Woolen Manufacturers Since 1856

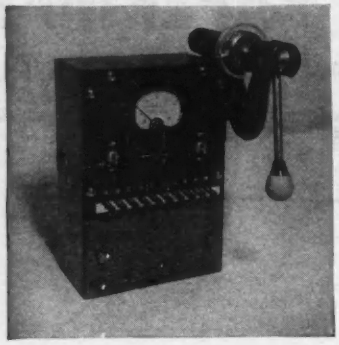
Canton, Massachusetts

RALPH E. BRIGGS Sales Manager

BRADFORD WEST PITTSFIELD, MASS. • WILLIAM N. CONNOR Jr CANTON, MASS. • L. H. BREYFOGLE KALAMAZOO, MICH. • CHAS. E. BERTSCHY MILWAUKEE, WIS. • W. L. CAMPBELL SAVANNAH, GA. • BALFOUR GUTHRIE & CO. Ltd. PACIFIC COAST

Hart Moisture Meter Suffuses Static

A recent development which will add to the usefulness of Hart moisture meters in mills where severe static conditions sometimes prevail, is an arrangement assembled as part of the contactor which completely isolates from all external electrical influence, the portion of the sample involved in the test. This results in a perfectly steady needle so that the instrument may be employed immediately beside



HART MOISTURE METER

a running web of paper, or even of dry felt, and will perform with complete satisfaction even in the presence of severe static. This device is not necessary in all millls but it has been found highly desirable especially in the northern part of the country and Canada, according to Hart Moisture Meters, Grand Central Terminal, New York, 17.

The company now recommends that when the meter is applied to most papers, the sample be folded several times. This has the advantage of producing a reading and the folding also retards any tendency for the moisture percentage of the paper to change. The company has completed arrangements wherein they offer to add, at reasonable charge, the new static suppressor, to any meters now in service, which were purchased since October 1st, 1944.

Grove Valve Uses Synthetic Rubber

From the standpoint of design, construction and operation, the Grove Chexflo Valve represents the utmost in simplicity and safety. Operation is effected by a synthetic rubber tube, stretched over a slotted, cup-shaped metal core, which expands to open and contracts to close. Due to the fact that this expansible tube closes instantly on balanced flow, prior to the commencement of back flow, there is never any tendency to establish pressure impulses, shock or water hammer through the flow line. The flexive tube possesses a uniform and constant spring rate which avoids inertia being set up to cause operation beyond flow requirements. It likewise, improves in service due to the fact that "flexing" adds life to rubber.

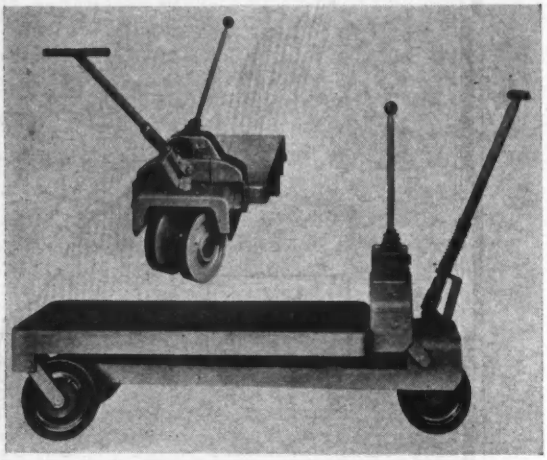
Because of its self-compensating and wear resistant factors this unit is said to be particularly suited for handling even the most highly corrosive and erosive air, gases or liquids. Full details contained in Bulletin 610 are available on request to Grove Regulator Company, 6580 Green Street at 65th, Oakland 8, California.

Market Forge Standardizes "Load Lift"

Product engineers of the Market Forge Company, Everett, Mass., have recently completed the development of a new standardized lift truck called "Load-Lift".

This newest addition to their line of standardized materials handling equipment is the result of a very thorough investigation of the lift truck market as a whole, in an attempt to develop a modernized and simplified model. Market Forge has added many new and exclusive operational features which are said to increase the lift truck efficiency—plus several safety features.

The first step in standardizing the lift truck is the limitation to two capacities of 3,000 pounds and 5,000 pounds, which fills the requirements of hand-operated trucks in the materials handling field. In this way, a superior truck is being supplied at no greater cost. The Load-Lift utilizes the hydraulic principle in lifting. An improvement over the anti-friction roller bearings in the wheels is sealed ball bearings in the



MARKET FORGE'S NEW LOAD-LIFT

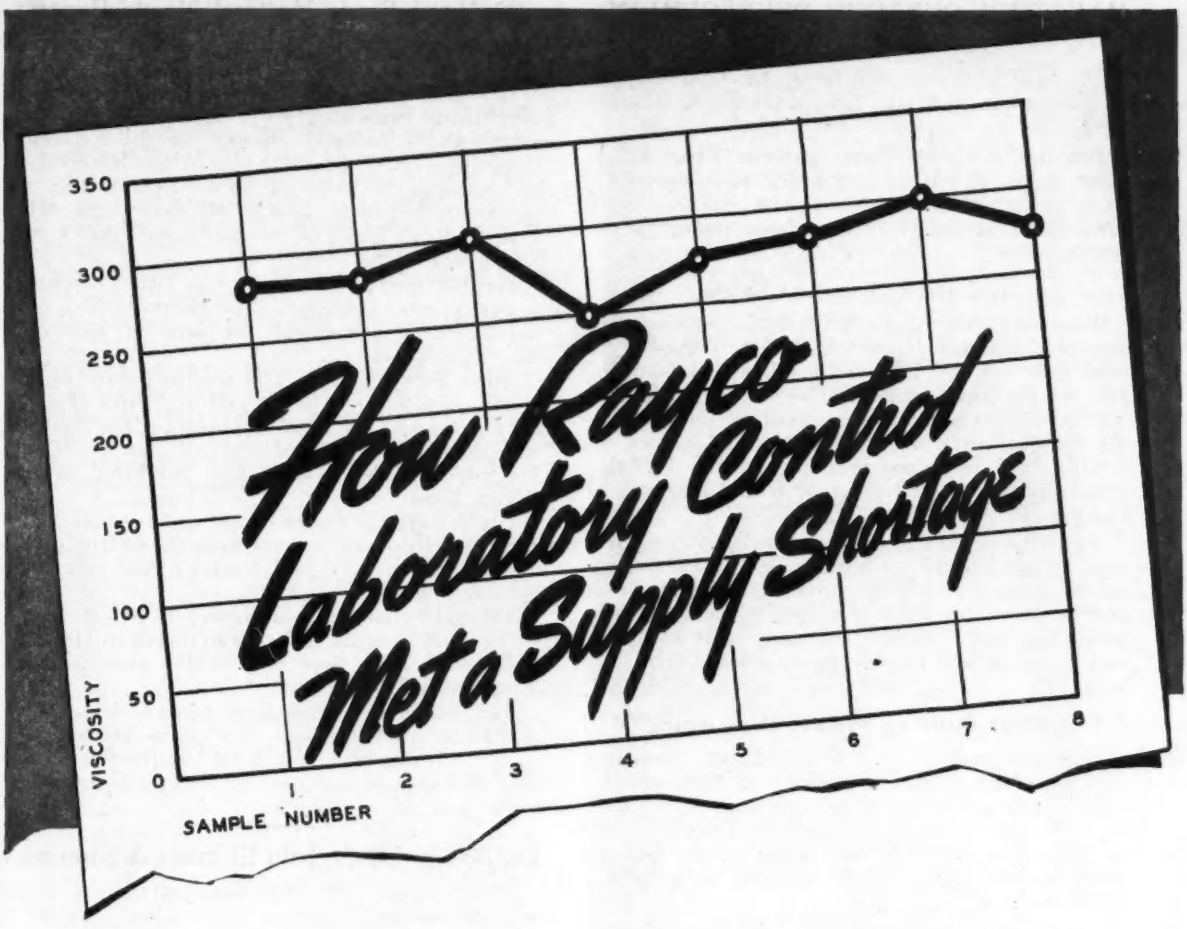
wheels, which means lubrication for life. Also, this promotes easy movement of the wheels. All-steel wheels have also been specified instead of cast iron wheels, which means that the wheels are unbreakable, lighter and longer-wearing. Plastic wheels and rubber wheels will also be available.

Lockport Felt Names A. B. Julin

NEWFANE, N. Y., January 14, 1946—The Lockport Felt Company has appointed A. B. Julin, of Watertown as their new representative in the northern New York state area. Mr. Julin assumes position held by the late John S. Harrington. The Lockport Felt Company is the sole manufacturer of "TENAX" Pulp and Paper Felts.

Stevens Back from Marine Corps

FITCHBURG, Mass., January 8, 1946—John C. Stevens, associated with Linton Brothers & Company, is back at his desk after having served two years with the Marine Corps. About half the time of his service was spent in this country, where he got his experience in the hard way at boot camp. The other half of his service was spent at Pearl Harbor. He returned to this country in November and was discharged in December.



How Rayco Laboratory Control Met a Supply Shortage

This year's cotton crop—the shortest in ten years and also the latest—resulted in a considerable decrease in the supply of the top grades of Rayco Linter Cotton which we have been supplying the manufacturers of fine papers.

Anticipating this shortage, our laboratories conducted extensive tests with linter cotton of available grades. These tests proved that some of these fibers were satisfactory for the production of cotton content papers. Rayco Linter Cotton of these types is now being successfully used in large quantities in the making of fine paper.

As a result of our pioneering research and in-the-mill technical studies, we can demonstrate how uniformly clean, carefully graded and inspected Rayco Linter Cotton can help speed your production and lower your cost. Write today for detailed information.

THE RAILWAY SUPPLY & MFG. CO. and Affiliates

Specialists in Grading, Marketing and Processing Cotton Fibers

General Offices: Cincinnati, Ohio

Plants and Sales Offices: Cincinnati, Ohio; Franklin, Ohio; Atlanta, Ga.; Charlotte, N. C.; Covington, Tenn.; Greensboro, N. C.; New York, N. Y.; Chicago, Ill.; Detroit, Mich.

RAYCO LINTER COTTON

MARATHON OUTLINES DEVELOPMENTS

(Continued from page 7)

The new substation will be in operation by next tall, according to Herbert F. Weckwerth, manager of the utility, if materials are available.

Both utilities supply power to Fox River Valley paper mills. The Kaukauna utility now buys some of its requirements from the private utility, and returns some surplus hydro-generated power to the company.

K-C Retirement List Large

Trustees of the Kimberly-Clark Corporation pension plan reported January 8 that the corporation's retirement list for 1945 is the highest in any one year of the firm's history. This, it was explained, was because many employes stayed on the job during the war years. Fifty-eight men and women retired in 1945, up to and including January 1 of this year, bringing the active list of retired employes to 142 persons.

The corporation's retirement plan covers employes who accumulate 15 or more years of consecutive service upon reaching 60 years of age for women and 65 years for men. The retirement plan is in addition to social security and the cost of its operation is maintained entirely by Kimberly-Clark Corporation.

Gilbert Building Project Progressing

Building projects at Gilbert Paper Company, Menasha, Wis., may be completed in three months, according to company officials. Shortage of building materials, early snow storms and difficulties in obtaining labor have delayed construction of an L-shaped office addition and a mill addition to include a cafeteria.

Cites Quonset Buildings as Housing Aid

C. H. Warsinske, an engineer in the Plastics division of the Consolidated Water Power and Paper Company at Wisconsin Rapids, Wis., who has made a private study of the housing situation, believes that Quonset structures may provide a temporary solution.

He pointed out that necessary materials can be obtained and that the home can be built in a week or two. While the Quonsets are limited in dimensions, 20 feet wide and 12-foot sections, a variety of floor plans can materialize.

Discusses Credit Unions and Banks

"Relationship of Credit Unions and Banks" was discussed January 8 by Russell Ward, president of the First National Bank at Neenah, Wis., at a meeting of the Winnebago County Chapter of Credit Unions at the Neenah city hall.

The chapter, which is in process of organization, includes Neenah Foundry Credit Union, Neenah Paper Company Credit Union, Kimberly-Clark main office unit, Marathon Corporation Credit Union and Lakeview Credit Union.

Last Safety Program Largely Attended

About 1,000 mill workers attended the last safety program of the current safety contest at the Kimberly, Wis., mill of Kimberly-Clark Corporation January 11 at the Kimberly clubhouse. The program was sponsored by the sulphite and technical departments, with William McDonald as master of ceremonies.

DeVries Finds Holland Needs Paper

Eli de Vries of the E. de Vries Company, New York City, has just returned from a trip to The Netherlands after a three-months stay in that country. Mr. de Vries travelled in his capacity as advisor to the Paper Industry Division of the Economic, Financial and Shipping Mission of the Kingdom of the Netherlands. Mr. de Vries declares that the paper situation in Holland is still very vague. Holland needs all kinds of papers. School books have been practically destroyed.

The big newsprint mill of van Gelder Zonen is in pretty good condition. The Germans may have had the intention to cripple the plant, but apparently they did not succeed.

Other paper mills in Holland, are more or less in fair condition except the mill of "Papier-Fabriek de Maasmond" in Paamsdonksveer. The building was completely destroyed and will not be rebuilt. The paper machines have been purchased by van Gelder Zonen.

The buildings of the two paper mills of van Gelder Zonen in Remkum were completely destroyed, but the machines are in good condition and everything is being done to repair them.

The toilet tissue mill in Gennep is completely destroyed and so is the mill of Pannekoek in Heelsum. Some other mills have been slightly damaged, but they, too, will be repaired.

The Netherlands expects to receive enough pulp in 1946 to produce about 40% of its pre-war production. However, this will only be possible if they have enough coal and electric power, factors which at the moment are uncertain.

Guilfoyle, Levin Join Skinner & Sherman

Daniel L. Guilfoyle, after four years in the Army, has returned to his former position with Skinner & Sherman, Inc., Consulting Chemists of Boston. Marshall Levin has also been added to the staff of the Bacteriological Department. Mr. Levin was recently returned from Guam where, as a member of Naval Medical Research Unit Number 2, he was engaged in the investigation of the chemistry of steroids relative to Tropical Diseases. Completing his studies in bacteriology and chemistry at the University of Minnesota in 1933, he was with the War Department until 1939, working in bacteriology and sanitation at the Army Medical School, Washington, D. C., and at the Army Medical Research Board, Canal Zone. During the war he was in charge of the Water and Sewage Laboratory, 11th Naval District, San Diego, and did original work in culture media and stains while with Naval Epidemiology Units in the United States and in the Pacific.

Atchley Retires at Crystal

The Crystal Tissue Company of Middletown, Ohio, January 11, 1946—Harry Atchley, after almost thirty years of employment with the Crystal Tissue Company, retired on January 1, as power superintendent. He had intended to retire prior to the war, but stayed on the job to do his part to keep the mill running during the most critical period of its history. He is the first Crystal employee to retire under the pension retirement plan set up for the benefit of Crystal employees as of December 28, 1945. Mr. Atchley's former assistant, Lowell Newman, becomes power superintendent.

St. Regis Starts $4,000,000 Expansion

An annual increase of more than 30,000 tons of bleached ground wood magazine and printing papers will be produced by St. Regis Paper Company through the $4,000,000 construction and expansion program which has been started at the Deferiet, New York, pulp and paper mill of the company's Printing and Publication Paper Division, President Roy K. Ferguson has announced. The increased volume will be in super calendered, machine finish and machine coated groundwood papers.

The Deferiet program provides for the initial large-scale production of bleached groundwood pulp by the new sodium peroxide process. This was developed during seven years of research by duPont scientists and has been adapted to large volume production for the first time in collaboration with St. Regis paper technicians, Mr. Ferguson said.

New construction and [illegible] WPB, including [illegible] Fourdrinier facilities [illegible] wood pulp [illegible] Robertson [illegible] and electric [illegible] of a new [illegible]

George [illegible] the construction [illegible] Boston, [illegible]

For the [illegible] of a 14-foot [illegible] three existing [illegible] grate the [illegible] making capacity [illegible] necessary [illegible] economical [illegible] ations.

Timber [illegible] State and [illegible] Canada [illegible] and company [illegible] leases. It [illegible] lands contain [illegible] These sources [illegible] and the [illegible] northern New [illegible]

Since [illegible] woods can be [illegible] will be [illegible] sources. The [illegible] Adirondack wo[illegible] of wood [illegible] en[illegible] sm[illegible]

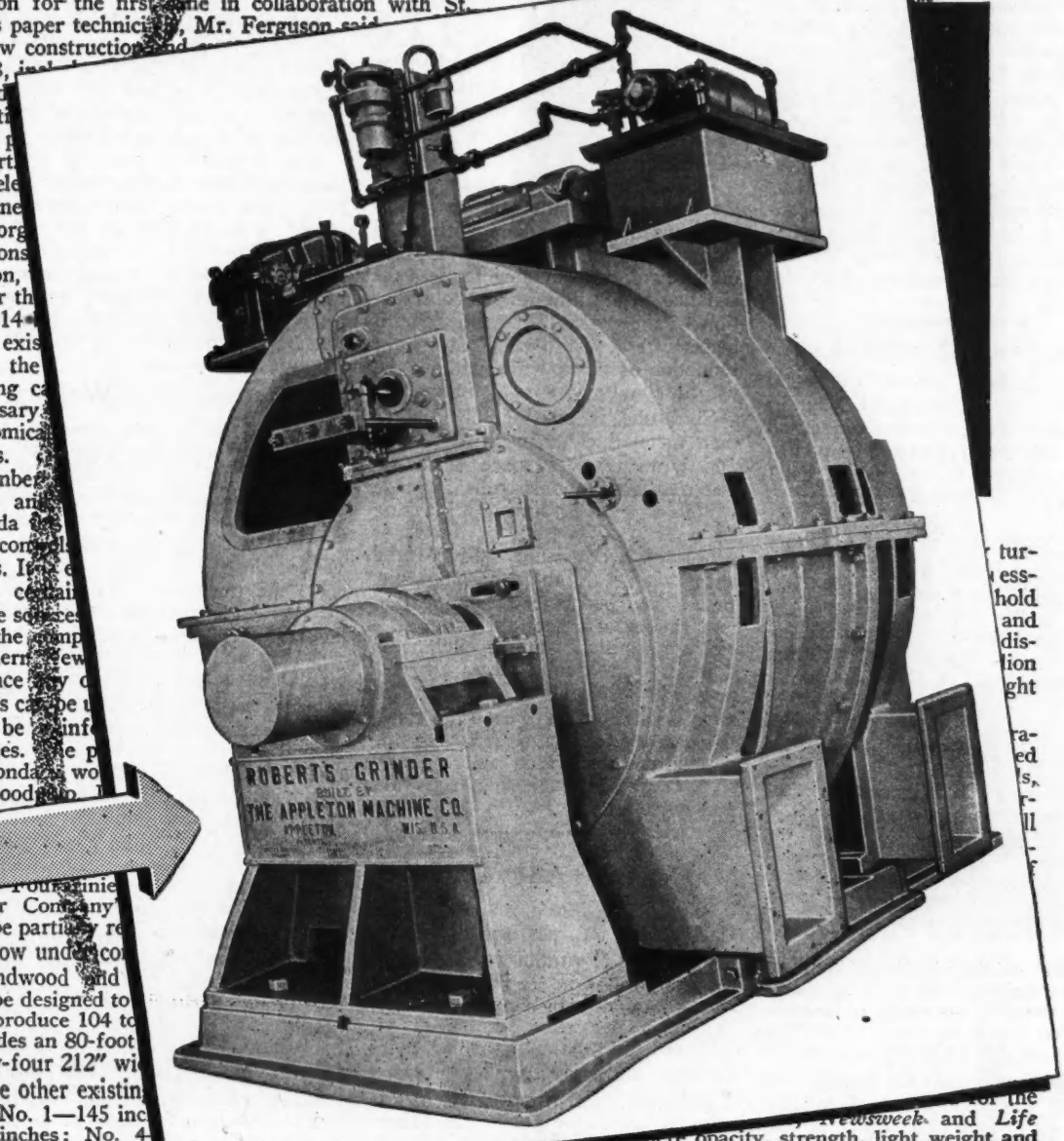
giant Fourdrinier [illegible] Paper Company [illegible] will be partially re[illegible] ing now under co[illegible] groundwood mill [illegible] will be designed to [illegible] and produce 104 to[illegible] includes an 80-foot [illegible] thirty-four 212" wi[illegible]

The other existing [illegible] are: No. 1—145 inc[illegible] 156 inches; No. 4[illegible] inches. No. 1, No. 4 [illegible]

same coated groundwood paper. Two [illegible] calenders [illegible] finish the output of the 3 and [illegible] 4 machines.

The wood handling project at Deferiet includes equipment to furnish 4-foot pulpwood to the groundwood mill. The mill formerly used 2-foot pulpwood. Six Roberts' magazine type grinders will be installed to replace the 28 three pocket grinders now in operation. Other additions include heavier conveyors, a new drum, a larger storage pit, and a conveying flume for the 4-foot logs which will eliminate all manual handling of wood in the plant.

Another important feature of the mill is the [illegible] of a complete new [illegible] paper plant [illegible] evaporators



[illegible] for the *Newsweek* and *Life* [illegible] where opacity, strength, light weight and excellent printing qualities are important factors

New Air Separator

Under trade name Airfuge, a new separator for removing moisture, oil, scale, etc., from compressed air is announced by The Swartwout Co., 18511 Euclid Ave., Cleveland 12, Ohio. Utilizing the centrifugal principle which has characterized steam and oil separators made by this company for 45 years, the new product features simplicity of construction and operation and highly efficient separation. Repeated tests show that air delivered by the Swartwout Airfuge is 99 per cent or more free of contamination. Air entering the inlet is diverted positively to the inner wall of the round body and unwanted substances whirl out of the air stream and drain to the bottom. The cleaned air may be taken off horizontally or vertically from pipe-tapped ports. An integral float-operated trap releases condensate automatically. Separator is made of high-tensile iron; interior parts of corrosion-resisting materials. Bottom easily removed if necessary for cleaning. Made in three sizes for varying capacities and with a range of pipe connection sizes. Bulletin S-13 describes it.

Star Tells About Motors

Star Electric Motor Co., 200 Bloomfield Ave., Bloomfield, N. J., in a new eight-page, file-size, condensed catalog bulletin (printed in Spanish and Portuguese as well as English) presents specifications and descriptions of standard Motors and generators made by Star and describes facilities for building special motors. Illustrations show many typical applications in hoists, comminutors, canning machinery, diesel generators, dry-cleaning machinery, printing equipment, machine tools, and other equipment in which severe service conditions are encountered. Specifications and load capacities are included for squirrel-cage induction motors ½ to 200 HP; wound-rotor induction motors ½ to 200 HP; direct current motors one to 200 HP; and design features of Star generators and brakemotors.

New Guide for Pipe Users

A new catalog featuring applications of light-weight pipe in diameters from four to thirty inches has just been issued by the Naylor Pipe Company, Chicago. Illustrated throughout this book are installations showing the application of Naylor Lockseam Spiralweld Pipe in the many fields in which light-weight pipe is used to advantage. Along with valuable data on pipe structure are sections on precision fabrication and pipe connections including an entirely new type of coupling which saves time and labor for users. A registered copy of this 56-page catalog may be obtained by writing Naylor Pipe Company, 1230 East 92nd Street, Chicago 19, Illinois.

Warner Improves Spiratube

A new type of flexible tubing, non-collapsible under plus or minus pressures and retractable to about one-eighth its extended length, is announced by The Warner Brothers Company, Spiratube Division, Bridgeport, Conn., for portable or semi-permanent ventilation or any handling of air, gases or light solids. Its spring steel helix core causes it to spring out, like a jack-in-the-box, to its fully extended length, and it will stay in this position regardless of whether it is working on pressure or suction.

A feature of the Spiratube construction is the method of spiral-stitching the spring core within the fabric. The inside surface is free of wire ridges, providing far less resistance to air flow and no obstruction to the passage of solids. Sharp bends can be made with only slight reduction of air flow and without the use of elbows or special fittings.

Spiratube is considerably lighter than metal duct or moulded tubing, and takes up less space when retracted. The standard tube is made of long-fibre duck, having a bursting strength of 170 psi; the fabric is processed fire-resistant and covered with tough, durable thermoplastic. It can also be made to specification in a variety of other fabrics for special applications. Spiral-stitching is done with a double seam of rot-proofed thread. There is no exposed metal inside or out, (even the couplings are covered), eliminating the possibility of sparking where explosive or imflammable materials are present.

Hendrick Adds Three

Hendrick Manufacturing Co., Carbondale, Pa., perforated and fabricated metal producers, has made three additions to its sales force, it was announced by Trowbridge A. Warner, sales manager. Clyde M. Watson, of Atlanta, will cover Georgia and Florida; R. Grayson Yarrington, of Baltimore, will handle sales in the major portion of Maryland, and the third addition is Westchester Steel Products, of White Plains, N.Y.

Board Mill Enjoined

Charged with selling paperboard at overceiling prices, the Chesapeake Paperboard Company, located at Baltimore, Md., and James E. Smith, its president, paid $29,000 to the United States Treasury and consented to a permanent injunction, it was announced by Leo F. Gentner, Regional OPA Administrator.

Under the terms of the injunction decree signed by Judge W. Calvin Chestnut of the United States District Court for the District of Maryland, both defendants are permanently enjoined from future violations of RPS 32, the regulation dealing with the sale of manufactured paperboard.

Mr. Gentner pointed out that the investigation in this case was conducted jointly by the New York and Baltimore Offices and that this settlement represents one of the largest made with a paperboard mill.

"All indications point to a continued shortage of paperboard in the foreseeable future," Mr. Gentner declared, commenting on the settlement. "The OPA is determined to exert its efforts in making this commodity, as well as others necessary to reconversion, available to purchasers at existing ceiling prices."

United Talks of Welding

A new engineering manual entitled, "Tailoring in Metal," is offered by The United Welding Company, Middletown, Ohio. It discusses factors affecting the choice of welded fabrication and the techniques of welded design. As stated by the author, the purpose of the manual is to help engineers and designers decide for themselves if fabrication by welding and the materials made available by this method are applicable to the problem. The factors involved in a decision are cost, weight, strength, appearance, stability, noise, quality, and delivery.

Various types of welds are explained, and how they affect static and fatigue load values. Of particular interest to the designer is specific information about devices which can be employed to reduce cost and improve construction. The methods are profusely illustrated with drawings and photographs.

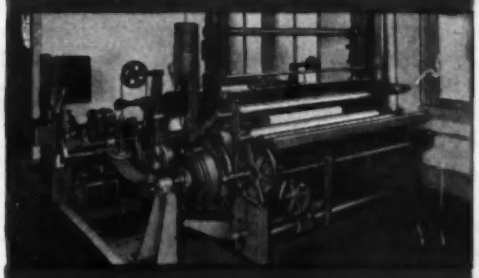
Although written particularly for manufacturers of machinery and equipment, the manual is interesting to everyone involved in shop maintenance because of the application of welding to such fabrications as gear blanks, pulleys, tanks, casings, housings, frames, breechings, stacks, etc. A copy will be sent upon request.

D-c, adjustable-voltage drives—For single- or double-motor winders where tension-control can be adequately maintained by mechanical means, G.E. furnishes complete drives from 20 to 400 hp, including motor-generator set, d-c motors, and 50-division generator-field control. A factory-assembled control panel includes all the necessary contactors, overload relays, and resistors.

A-c wound-rotor drives—on winders where speed control need not be critical over a wide range, G.E. supplies drives powered by a-c wound-rotor motors, with simple, long-lasting drum-type controllers.

Electronic side-register control for winders, slitters—A photo-electric scanning head directed at the edge of the sheet detects any variation in position. A G-E amplidyne powers a motor which corrects the roll position (see photo at right).

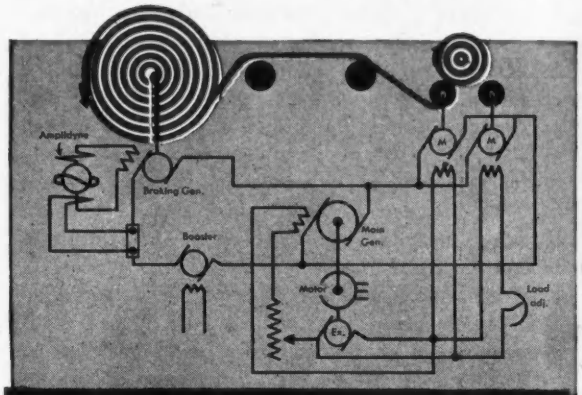
G-E equipped, single-motor winder drive



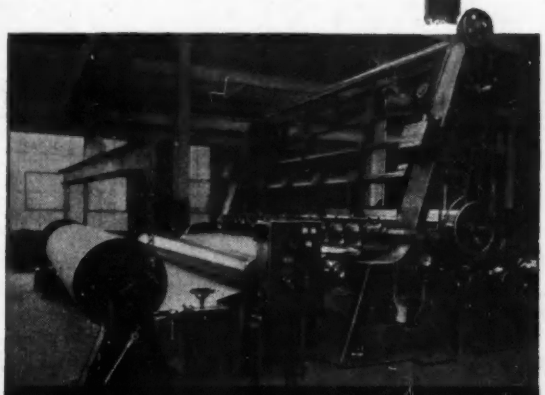
G-E side-register control on paper winder and slitter (Scanning head shown just below counterweight.)

Tension can be adjusted precisely by a dial on the operator's panel. An amplidyne and booster-generator unit maintains stalled tension, aids smooth starts, and thus avoids paper breaks.

A factory-assembled main control panel, and a metal-enclosed operator's panel conveniently located, are included in the complete drive.



Circuit diagram for G-E adjustable-voltage winder drive



Side view of winder, showing convenient operator's control panel for regulating speed and tension

GENERAL ELECTRIC

663-21-137

PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.
W. L. Cook, Editor

PAPER OUTPUT RISING

Paper production for the current year is expected to approximate 18,300,000 tons, or about 1,000,000 tons above 1945. Estimates of the Bureau of the Census are somewhat more conservative at 18,000,000 tons, with 3,000,000 tons of exports from Canada. It is possible that our earlier estimates of 19,000,000 tons of domestic paper may be exceeded. A substantial increase in pulpwood, more waste fibrous materials, a favorable labor supply, with the general labor disputes settled would, of course, make it possible to increase the industry's output. Price increases already granted by the OPA have already had a favorable reaction in the production of newsprint and have begun to increase the output of some nineteen grades of groundwood specialty papers. In view of the large wage increases made and in prospect in almost all industries, a more favorable price schedule appears inevitable this year, based, not upon an obsolete wartime formula, but established upon realistic labor costs in 1946, which in general will likely average between 15 and 20% higher than formerly. As the paper and pulp industry is favored with excellent labor relations, most wage adjustments can be made without strikes and serious loss of production arising from acute labor dissensions.

In its analysis of operations the Bureau of the Census in its latest industry report of the paper industry states that, paper and paperboard mill operations in November and the first half of December, 1945, have held at high levels. However, because of fewer working days in November, production did not equal the large volume of 1,572,692 tons reported by the Census Bureau for October, which was the highest monthly output recorded since the collection of these monthly Census data started in January, 1943. December production will undoubtedly be much reduced by the year-end holiday shut-downs which are customary and particularly important this year to get equipment in condition for anticipated heavy operations in 1946. The prospects are that the volume of both paper production and consumption will reach record levels in 1946. By and large, paper consumers came out of the war with unprecedentedly low inventories. These must be rebuilt. In addition, current consumption requirements must be met, and they will probably exceed any former peacetime record by 25%. There is, however, considerable evidence that paper purchasers are tending to buy as far forward as they can in a manner suggestive of the speculative purchase waves of the early war years. This is likely to continue until supply and demand balance. Undoubtedly paper manufacturers will be able to sell all of the paper which they can produce in 1946.

The problems of the manufacturer, the Census report goes on to state, thereby center principally in the maintenance of production levels. The first step is to secure sufficient supplies of fibrous materials. During the war, pulpwood and waste paper were barely adequate for military and the more essential civilian needs. Since the termination of hostilities substantial changes have taken place which augur well for the future. Both pulpwood and waste paper receipts are being maintained, and the probabilities are that conditions will improve rapidly as labor released from the war effort returns to former occupations. The supply of wood available for pulp-purchasing mills has been increased since VE-Day by more than a half million tons by the return of Swedish wood pulp to the American market. Continued heavy importation from Sweden is expected in 1946 and some additional imports from Norway and Finland seem to be assured. Wood pulp imports from Canada will be substantially greater in 1946, for several new production units will come into operation before the middle of the year. Also, Canadian exports to Great Britain will probably be less, which will make some additional wood pulp available for the American market. Repair and improvement programs in which practically every manufacturer is involved will continue throughout the year. There will be some increase in production capacity in 1946, but much of the expansion now planned will not be ready for operation until later years.

In commenting on the prospect for manufacturers of paper and paperboard the Census report states that, demand for paper and paperboard continue to exceed the supply with no indications of a slackening in the over-all picture. Mills are still screening the orders offered them, but the proportion of orders refused cannot be determined. During October, production of paperboard was at an annual rate of about 18,000,000 tons. The maintenance of a higher level of production depends on adequate supplies of raw materials, pulpwood, pulp, and waste paper, as well as labor. While it is not possible to measure accurately the current demand, it has been variously estimated as at a yearly rate as high as 25,000,000 tons which, of course, includes imported newsprint amounting to around 3,000,000 tons.

In referring to the revocation of governmental restrictions the report goes on to say that, since WPB controls were removed there has been some shifting of grades produced by certain branches of the industry due to changes in customers needs, more profitable grades, etc. Examples of this are the change from newsprint to book papers, increase in coated groundwood printing papers and heavier basis weights. An example of change in consumer requirements is demonstrated by the sharp drop in demand for certain high grade greaseproof paper.

Paper Imports Increasing

"The end of the war is already bringing indications of an increased competition in domestic paper markets," says Warren B. Bullock, Manager of the Import Committee of the American Paper Industry in a report to the Industry." One indication is a consignment of Swedish M. G. Kraft wrapping paper sent to this country for use as samples for prospective importers to use in circularising consumers. A large quantity of Canadian kraft paper is being imported as pulp, though it is of a character which permits its use as corrugating material for containers, saturation or even cheap wrapping."

Mr. Bullock then lists the following recent shipments which indicate a resumption of efforts by foreign producers to sell in the American market:

1. Imitation veneer paper from Canada, claimed to be wall paper, but principally used for box covering and greeting cards.
2. Canadian bleached kraft envelopes claimed to be dutiable as book paper stock, but held by Customs officials to be dutiable at the writing paper rate.
3. Airmail envelopes from Cuba, made of American paper, but converted abroad.
4. Book paper valued at 15 cents per pound.
5. Swiss papeterie, with lithographed scenic pictures.
6. Imports of printing paper from Canada for the first nine months of 1945 totaled 22,662 tons, or at the rate of 30,000 tons per year. This paper enjoys low duty rates under the Reciprocal Trade Agreement with Canada and compares with 9,000 tons imported before the low rates became effective.

Sweeney Opens Own Waste Business

ALBANY, N. Y., January 12, 1946—William P. Sweeney has just started in business. He has been associated with the Ash Trading Corporation for twelve years, has opened his own business in this city, operating as William P. Sweeney, Inc., Wholesale Waste Materials, P. O. Box 1588.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1945		Corresponding Weeks—1944	
Dec. 1	97.5	Dec. 2	91.0
Dec. 8	99.0	Dec. 9	93.7
Dec. 15	**99.0**	Dec. 16	89.3
Dec. 22	96.5	Dec. 23	84.6
Dec. 29 (Revised)	60.8	Dec. 30	62.0
Jan. 5,'46	*89.1*	Jan. 6,'45	81.0

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1944	88.7	88.5	88.1	87.6	88.7	89.8	80.3	90.6	88.2	92.5	90.6	92.4	88.1
1945	86.7	89.4	90.2	88.1	89.8	91.2	80.8	88.6	90.2	95.9	95.5	*91.0*	89.7

COMPARATIVE YEARLY SUMMARIES

	1938	1939	1940	1941	1942	1943	1944	1945
Year Average	71.5	83.4	85.6	97.4	90.4	87.8	88.1	*89.7*

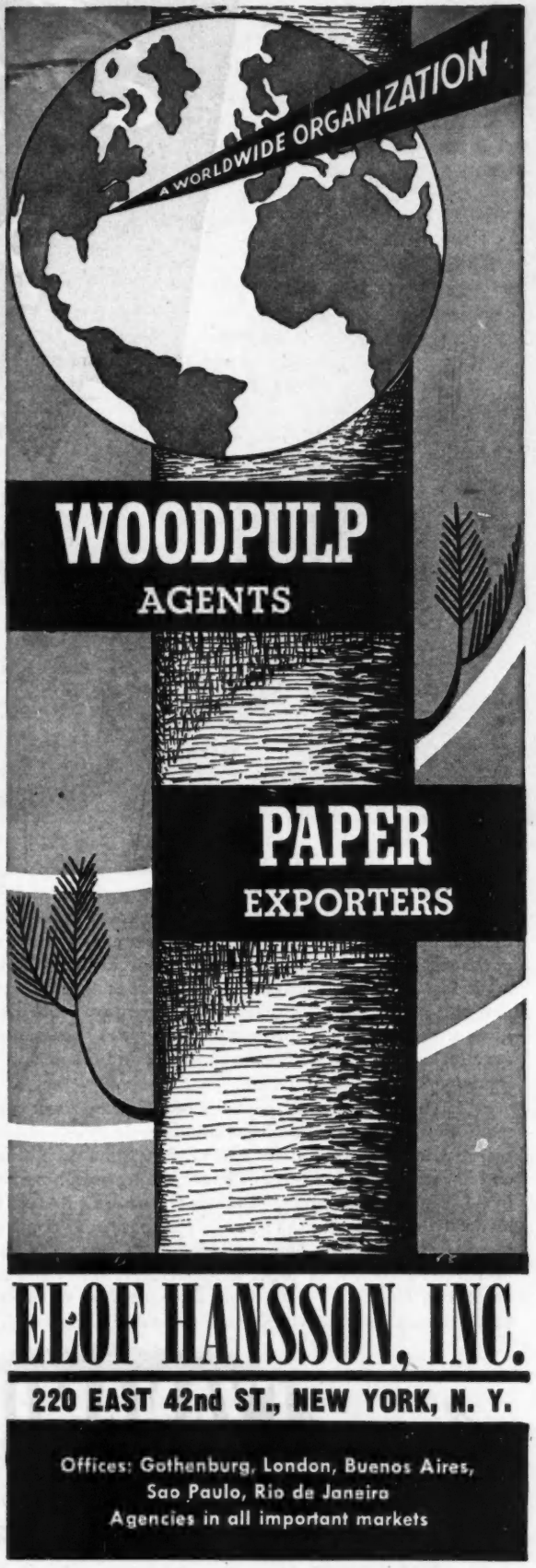
* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

Current Weeks—1945		Corresponding Weeks—1944	
Dec. 1	96	Dec. 2	94
Dec. 8	97	Dec. 9	95
Dec. 15	98	Dec. 16	94
Dec. 22	92	Dec. 23	94
Dec. 29	52	Dec. 30	57
Jan. 5,'46	*75*	Jan. 6,'45	80

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1944	90	96	95	96	96	96	85	96	92	95	95	85	93
1945	91	95	97	97	96	96	86	90	91	97	95	*85*	93

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.



Among the things that Mr. and Mrs. Consumer may look forward to will be new surprises in frozen foods. For new ways have been found to capture and hold that garden-fresh flavor of vegetables and fruits—and the unique savour of meats and fish. But one of the most interesting of the surprises will be the packages in which these foods will come. Look at the inner wrapper. Now . . . it is "high wet-strength" paper—paper that is extra strong when dry and will not lose its strength and fall apart even when soaking wet! Thus it gives a new measure of protection to foods . . . new convenience to the user . . . a real selling feature for the producer and retailer . . . *and a new profitable specialty for paper-makers!*

"High wet-strength" paper, which is also "wet-rub resistant", is now made by the use of a special synthetic resin developed in the Cyanamid Research Laboratories. Called PAREZ** 607 this resin imparts improved wet-and-dry strength to any type of paper, from paper-board to fine tissue, simply by adding the resin prepared under Cyanamid's patents in the regular paper manufacturing process. As a result, paper is today doing many of its old jobs better and also many entirely new jobs. Cyanamid's Paper Technicians are prepared to work with paper manufacturers interested in the proven potentialities of PAREZ to make paper do many of its old jobs better and find new fields of usefulness in serving your product and packaging paper needs.

Here are a few of the many types of

PAREZ TREATED PAPER STOCKS...

Offset & Lithograph Papers
•
Meat Wrap
•
Absorbent Papers for Aqueous Impregnations
•
Blue Print Papers
•
Carton, Crate & Barrel Liners
•
Multi-Wall Bags
•
Shopping Bags
•
Ice Cream Containers
•
Cleansing Tissues and Paper Towels
•
Frozen Food Wrappers
•
Shipping Labels and Tags
•
Twisting Papers
•
Coating Raw Stocks

*Reg. U. S. Pat. Off.

**Trade-mark of American Cyanamid and Chemical Corporation applied to its synthetic resins for use by the paper industry. The processes under which PAREZ is applied in the production of wet-strength paper are covered by U. S. Patents Nos. 2,291,079; 2,291,080 and 2,345,543 and U. S. Patent Application Serial No. 435,032.

American CYANAMID & Chemical Corporation

(A Unit of American Cyanamid Company)

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DISTRICT OFFICES: Boston, Mass.; Philadelphia, Pa.; Baltimore, Md.; Charlotte, N. C.; Cleveland, Ohio; Chicago, Ill.; Kalamazoo, Mich.; Detroit, Mich.; St. Louis, Mo.; Azusa, Calif.; Seattle, Wash. In Canada: Dillons Chemical Company, Ltd., Montreal and Toronto.

Section of the
TECHNICAL ASSOCIATION
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Edited by R. G. Macdonald, Secretary

Cross Linkages in Cellulose and Their Practical Implications*

By Emil Heuser[1]

Abstract

A discussion is presented of the data which indicate that cellulose can be considered as being a system of adjacent chain molecules, probably being held together in the lateral direction not only by secondary valences, as by van der Waal forces and hydrogen bonds, but also by cross bonds of primary valence character.

The effects of formaldehyde treatment upon the properties of cellulose are reviewed with attention given to the claims of a recent U. S. patent to Kantorowicz which are based upon the alkali solubility reducing effect of the formaldehyde treatment.

If cellulose is considered as representing a system of adjacent chain molecules, aligned more or less parallel in the longitudinal direction, the probability exists that these chains are held together in the lateral direction not only by secondary valences, as by van der Waal forces and hydrogen bonds, but also by cross bonds of primary valence character. Such cross linkages could be the result of (1) a rearrangement of amylene oxide rings (assumed to exist within the individual anhydroglucose members of the chain); (2) condensation between hydroxyl groups located in opposite positions of adjacent chains; and (3) glycosidic interaction between the hydroxyl group in the 4-position of the one terminating anhydroglucose unit of one chain and the potential reducing group of the other terminating unit of an adjacent chain.

The existence or nonexistence of primary valence cross linkages of the first two types between adjacent chain molecules in cellulose was a rather ardent, but also stimulating, argument in the early polemics which were fought over the molecular structure of cellulose some twenty years ago. When, not much later, the exact results of the kinetics of cellulose hydrolysis became known, the cross-linkage concept was discarded, because these results left no room in cellulose for primary valences other than glycosidic bonds being operative between the individual anhydroglucose units of the chain. It is only recently that the cross-linkage concept has been revived without, however, making an attempt to reconcile this concept with the postulate derived from the results of the kinetics of cellulose hydrolysis.

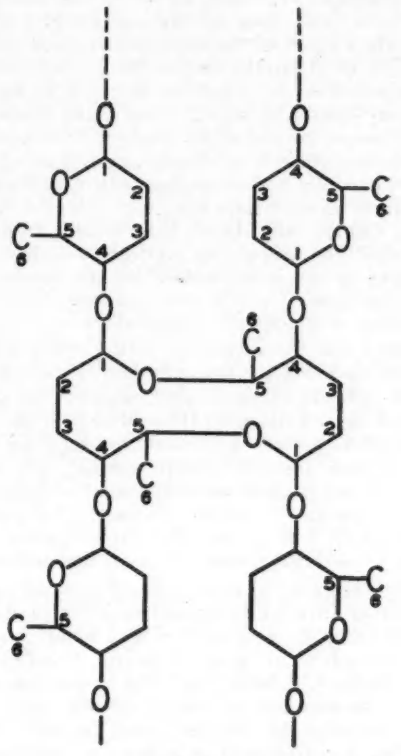


FIG. 1

Cross Linkages

The possible existence of the first type of cross linkages mentioned above has recently been discussed by Hess and Steurer *(1)*. They have suggested that, during some stage of cellulose development in the plant, some of the glucopyranose rings of adjacent chains may open and thus furnish the bonds for the cross linking of these chains. An arrangement of this type is seen in Fig. 1.

The amylene oxide rings (i.e., those connecting carbon atoms 1 and 5 through an oxygen atom) of two opposite anhydroglucose units are opened, and bonding is established between carbon atom 1 of the one unit and carbon atom 5 of the other through the oxygen of the previously closed ring. A second oxygen bond is formed by the same rearrangement be-

* To be presented by title at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 25-28, 1946.

[1] Member TAPPI; Research Associate, The Institute of Paper Chemistry, Appleton, Wis.

tween carbon atom 5 of the one and carbon atom 1 of the other unit. Thus, a double cross linkage is established between two adjacent chains.

Hess and Steurer have retained for this type of cross linkage the term "intermeshing bridges" which was used in the polemics mentioned above.

These investigators resuggested the cross-linkage concept because of the observation that methylcellulose, after irradiation of its solution in dioxane with ultraviolet light for a certain length of time, showed a considerable decrease in viscosity, but only a slight increase in end-group content (determined as the percentage of tetramethylglucose resulting from methylation and subsequent hydrolysis of the methylated cellulose). In other words, while the sample was being irradiated, the degree of polymerization (D.P.) as derived from the viscosity data decreased at a considerably faster rate than did the D.P. derived from the end-group content. The behavior of methylcellulose was explained on the assumption that the cross linkages are ruptured by the ultraviolet energy at a faster rate than are the normal glycosidic linkages. As a result of the existence of cross linkages, in addition to glycosidic bonds, the particle size of the methylcellulose in solution and, hence, its solution viscosity would be higher than if the cross linkages were absent, provided the methylcellulose concentration is low enough to eliminate physical aggregation of the particles and to produce viscosity data suitable for their conversion into molecular weights and D.Ps. On the other hand, it is evident from the picture that the end-group content is independent of whether or not individual chains are united through cross linkages. Thus, if for a moment, a state of irradiation is assumed at which the cross linkages are ruptured but the glycosidic linkages are still intact, we will find that the viscosity has decreased, as compared with the original value, whereas the end-group content has not changed. It is only when, on continued irradiation, normal glycosidic linkages are also attacked that the end-group content will increase, whereas the viscosity will continue to decrease.

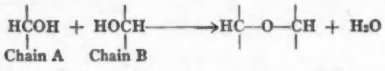
Discrepancies between viscosity D.Ps. and end-group D.Ps. have cause other investigators to resort to the cross-linkage concept as an explanation.

On attempting to methylate cellulose to a high degree of substitution by subjecting it (or premethylated cellulose) to the action of methyl iodide and sodium metal dissolved in liquid ammonia, Freudenberg and co-workers *(2)* found that the ether thus obtained has a considerably decreased viscosity, as compared with the original cellulose value, without, however, showing a corresponding increase in end-group content. As an explanation, it was suggested that, in cellulose, the chain molecules are "somehow interknotted" in the lateral direction and that the viscosity decrease is caused by the elimination of these interknotting bonds during the methylation treatment.

Haworth and co-workers *(3)* observed that methylcellulose resulting from methylation in a nitrogen atmosphere gave no end-group value but a considerably lower viscosity D.P. than that shown by the unmethylated cellulose. On the other hand, methylcellulose resulting from methylation in air showed a decrease in both end-group and viscosity D.Ps. As an explanation of this discrepancy, Haworth *(4)* has suggested that on methylation, even in nitrogen, cellulose is degraded but that the end groups, thus formed, become involved in some kind of recombination, whereas on methylation in air, this recombination is prohibited. In order that the chains would always be able to submit to closure at their ends, the assumption is made that, in the original cellulose, the chains are kept in position by cross linkages at various points along their lengths. In passing, it is interesting to mention that Haworth has invoked the cross-linkage concept also to explain why cellulose is insoluble in water, whereas lichenin, a carbohydrate having a molecular structure very similar to that of cellulose, is water soluble. The cross linkages in cellulose would suppress the solubilizing effect of its hydroxyl groups; the absence of such blocking cross bonds in lichenin, however, would give the water molecules unhampered access.

Whereas Haworth's hypothesis thus involves the existence and the formation of cross linkages as a result of (glycosidic) interaction between potential reducing end groups and terminating hydroxyl groups, as well as the condensation of hydroxyl groups located in opposite positions of adjacent chains, two examples are available in which cross bonding is limited to hydroxyl groups.

Karrer and Escher *(5)* have suggested that the difficulties which are encountered in attempts to introduce into cellulose the full alkyl content which the tri-ether stage theoretically requires are caused by the presence of cross linkages between opposite hydroxyl groups in adjacent chains—obviously ether linkages resulting from the elimination of one molecule of water per two hydroxyl groups—which thus block a corresponding number of hydroxyl groups. It is only after hydrolysis with acids that the theoretical amount of alkyl may be introduced. According to Karrer and Escher, hydrolysis, however, does not rupture the cross linkages but is confined to the break down of glycosidic linkages, thus producing additional free hydroxyl groups which are simultaneously alkylated. In fact, the alkyl content of alkylcellulose prepared from degraded cellulose often surpasses the theoretical requirement for the tri-ether stage, which may mean that a greater number of hydroxyl groups are produced on hydrolysis than withstand hydrolysis in their blocked positions. Although it might be justifiable to ascribe to the ether linkages a somewhat greater resistance towards acids than is possessed by the normal glycosidic bonds, no attempt has been made to furnish experimental evidence for or against this presumption. Likewise, it remains a question whether the condensation reaction which produces the cross linkages and which may be formulated thus:



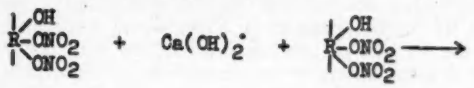
occurs during the early stages of fiber development or, subsequently, under atmospheric influences or, still later, during some of the steps of fiber isolation, be it in the laboratory or commericially.

Stamm and Hansen *(6)* have suggested that condensation of this type might occur when cellulose is dried at an elevated temperature or, to a still greater extent, during the first phase of destructive distillation which involves temperatures up to about 200° C. The strength of such ether linkages may explain the irreversible loss in hygroscopicity and swelling ability which wood, pulp, and other forms of cellulose show even after drying under mild conditions.

A second class of primary valence cross linkages may owe its existence to the introduction into cellulose of new atoms or groups. In all these cases, it is primarily the hydroxyl groups of cellulose which are involved.

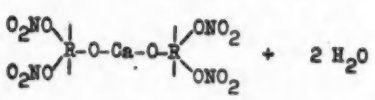
Early investigators observed that the viscosity of

nitrocellulose solutions in organic solvents increased quite considerably when only small quantities of alkaline earth or heavy metal oxides were added to the solution, and decreased again when the solution was subsequently acidified with hydrochloric acid. This phenomenon, which heretofore has been explained in a rather unsatisfactory manner, would seem to be better understood if it were interpreted in terms of a cross-linkage concept as suggested by Rogovin and Schlachover *(7)*. They assume that the alkaline earth or heavy metal oxide reacts in the form of its hydroxide (water being supplied by the moisture in the nitrocellulose sample) with free hydroxyl groups of the nitrocellulose in alcoholate fashion. If this reaction occurs with two hydroxyl groups located in adjacent chains, a cross linkage is formed through the alkaline earth or heavy metal atom.



Chain A Chain B

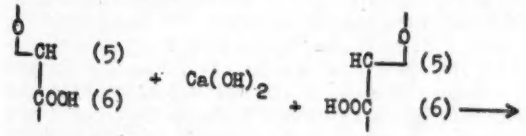
Cellulose Nitrate--Di-ester Stage



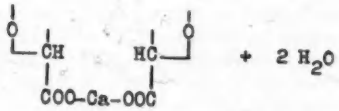
On acidification with hydrochloric acid, the calcium is removed. The same effect results from the dilution of the nitrocellulose solution. In fact, the increase in viscosity is observed only in rather concentrated but not in dilute solutions. It would appear that the water formed in the reaction suffices to cause dissociation of the nitrocellulose calcium compound if, as in a dilute solution, the amount present is rather small relative to the amount of water produced.

The increase in viscosity of the nitrocellulose solution is thus explained by an increase in particle size which results from the cross bonding of the chains, and the decrease in viscosity on acidification or dilution would follow from the restoration of single chains on the elimination of the calcium bridges.

It is possible, however, if not even more probable, that the cross linkages are formed between carboxyl rather than hydroxyl groups. Nitrocellulose may well contain occasional carboxyl groups—most likely in the 6-positions—as a result of the oxidation of hydoxyl groups in these positions under the influence of the nitrating acid. The addition of calcium oxide (or hydroxide) would then result in the cross linking of two carboxyl groups in different chains through the calcium cation. Thus:



Chain A Chain B

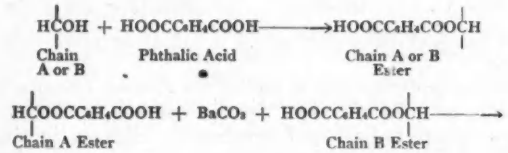


Such calcium cross linkages could also be present in unesterified cellulose, because native cellulose is seldom entirely free from carboxyl groups and always contains a relatively appreciable quantity of calcium ions.

The formation of calcium salts with carboxyl groups in cellulose is removed from the realm of speculation in the case of oxycellulose preparations of the nonreducing (acidic) type. For example, nitrogen dioxide-oxycellulose, which contains a large number of carboxyl groups in the 6-positions, easily forms calcium salts, the calcium content of which corresponds to the number of carboxyl groups present in the oxycellulose preparation. Whereas these salts and those with other polyvalent cations are insoluble in water, the sodium and other salts of the monovalent cations are easily water soluble. It is this insolubility of the oxycellulose salts with polyvalent cations which suggests that cross linkages of the type just discussed are responsible for this behavior, whereas such linkages are not involved in the formation of the monovalent cation salts *(8)*.

It should be added here that cellulose may carry carboxyl groups not only in the 6-position but also in the 2- or 3-position, or in all three positions. On superficial inspection, one would be inclined to believe that a calcium salt could also be formed between neighboring carboxyl groups—i.e., involving only single chains. However, it must be borne in mind that the hydroxyl groups in the 2- and 3-positions in the glucopyranose rings are located in different planes, which would place steric hindrances into the path of the reaction and that the greater distance between the hydroxyl groups in the 2- and the 6-positions would impede the reaction, although these hydroxyl groups lie in the same plane.

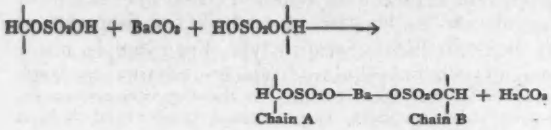
Another means of producing cross linkages between cellulose chains would seem to be the esterfication of cellulose with dibasic acids. If such acids are made to react only with one of their acidic groups, the other will be free to form salts with bases. If the bases are those of polyvalent cations, the cation may establish the bridge between two unesterified acid groups of two different chains, in much the same way as described above.



Phthalic acid ester of cellulose may be chosen as an example for the formation of this type of cross linkages. The esterification reaction (assuming that the cellulose unit reacts only with one of its three hydroxyl groups) and the formation of a barium salt are shown in the two equations above. Again, the cross-linkage concept would appear to be justified on the basis of the solubility properties of this and other similar salts in comparison with those displayed by the cellulose phthalates of monovalent cations; whereas the barium cellulose phthalate is insoluble, the sodium salt is easily soluble in water *(9)*.

An example of cross-linkage formation between ester groups in which the esterifying acid is of the inorganic type is furnished by the barium salt of cellulose sulphate. When sulphuric acid is allowed to act upon cellulose, experimental evidence shows

that this acid reacts with only one of its two acid hydroxyl groups, leaving the other free to form salts with bases. Again assuming that only one of the three hydroxyl groups of the cellulose unit is involved in the esterification reaction, the formation of the barium salt may be formulated thus:

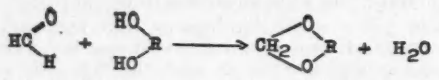


As would be expected, the barium salt is insoluble in water, whereas the sodium salt is water soluble.

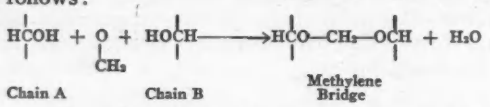
Formaldehyde-treated Cellulose

One of the most interesting examples of cross linkages resulting from the introduction of new groups into cellulose is the methylene bridge. These bridges may be established between adjacent chains by treating cellulose with formaldehyde in the presence of an acid catalyst and subsequent heating. This treatment is of considerable practical interest, because it may be used to impart increased wet strength to rayon and paper.

The reaction between cellulose and formaldehyde is that of acetal formation—i.e., a reaction between the aldehyde group of an aldehyde and two hydroxyl groups of a hydroxy compound. Thus:



If the hydroxy compound is cellulose, it is improbable, for the reasons advanced above, that the two neighboring hydroxyl groups (i.e., in the 2- and 3-positions of one glucose unit) are involved in this reaction. Rather, it may be assumed that the formaldehyde engages hydroxyl groups located in different planes and in different chains. The reaction may be formulated as follows:



The product thus formed is a cellulose methylene ether.

It is significant that a methylene content of only 1 to 2%, or even of only a fraction of 1%, suffices to bring about radical and remarkable changes in the physical properties of the ether and in its behavior towards various reagents. The most essential changes, relative to the untreated cellulose, may be summarized as follows:

1. A greatly dimished swelling ability in water and aqueous alkalies. With the introduction of relatively large amounts of methylene, the ether may lose its swelling ability entirely. Methylenecellulose containing 7.5% combined formaldehyde is so brittle that it may be pulverized in a mortar like sugar.

2. In the case of rayon or other forms of regenerated cellulose, a marked reduction in alkali solubility. For example, a viscose rayon which has a solubility in cold 10% sodium hydroxide solution of up to 40%, may, after the introduction of about 2% combined formaldehyde, become completely insoluble in this reagent.

3. A reduction in or complete loss of solubility in cuprammonium hydroxide.

4. Increased tensile strength and much improved relative wet strength—i.e., the loss in strength after wetting is decreased in comparison with the untreated sample. A reduction in plastic elongation (irreversible deformation).

Theoretically, a ratio of one methylene group to two anhydroglucose units requires a combined formaldehyde content of about 4%. That considerably less than this amount suffices to bring about the radical changes mentioned above shows that only a fraction of the hydroxyl groups available in the cellulose chain system is involved and that the methylene bridges are probably distributed in a manner which interlocks all the cellulose chains.

Such a distribution would be similar to the picture which Staudinger *(10)* has suggested to illustrate the distribution of a very small amount of divinylbenzene within the chain molecules of polymerized styrene. Staudinger has shown that as small a quantity as 0.002% of divinylbenzene, if allowed to be present during the styrene polymerization reaction, suffices to convert a soluble styrene polymer into an insoluble product. Staudinger's concept is shown in Fig. 2.

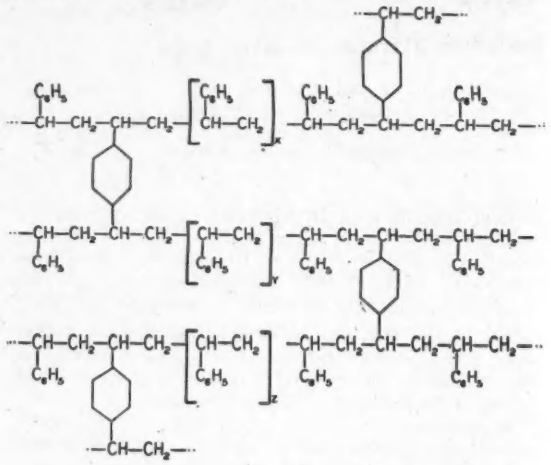


FIG. 2

The occurrence of methylene bridges in formaldehyde-treated cellulose would explain the physical changes which have been summarized above. The interlocking of the chains should diminish their tendency to slip against each other in the longitudinal direction when exposed to tensile stress, resulting in increased tensile strength. On the other hand, the increased rigidity of the system should cause greater resistance to plastic elongation. Provided there are not too many cross linkages, the elastic or recoverable elongation (resiliency) would probably be improved. This effect may be expected to become more pronounced if larger bridges are present—i.e., those resulting from the introduction, for example, of hexa- and decamethylene. A more flexible system would thus be produced. Although the methylene bridges should hardly impede the entrance of liquids into the spaces between the chain bundles or micelles (intermicellar swelling) they would, however, tend to prevent the chains from moving apart in the lateral direction. As a result, the swelling ability of the system in water, alkali, and other bases should be reduced and, as long as the bridges hold, the system would more or less resist dissolution in strong aqueous alkali and cuprammonium hydroxide. Likewise, as long as the chains remain interlocked in cellulose in the water-wet condition, both wet tensile strength and relative wet strength should be improved.

Remarkable results have recently been achieved in the commercial application of the formaldehyde treatment to rayon. Since these results may be expected to serve as an incentive to similar studies in the paper field, a brief summary of what has been accomplished with rayon should be of some interest.

It may be inserted here that the early attempts to improve the wet strength of rayon, which go back to the year 1906, were not very successful; perhaps this was because the dehydrating agent or "catalyst," which is required to accomplish the reaction, consisted essentially of sulphuric acid; and, since rather strong solutions were used, the rayon fibers suffered considerable damage. During recent years, milder catalysts have come into use—for example, aqueous aluminum chloride, ammonium chloride, or the latter in combination with boric acid. In addition, more knowledge has been acquired of how to control the reaction, particularly as regards the hydrogen ion concentration.

The studies of Dillenius *(11)* represent perhaps the most comprehensive investigation in the field. Dillenius has shown that the introduction of methylene bridges makes it possible not only to prevent but also to restore the losses in tensile strength which result from a breakdown of glycosidic linkages—i.e., of the average chain length, even to a point at which such degraded rayon would be rather useless for commercial purposes.

In a series of experiments in which the pH of the formaldehyde solution was decreased stepwise from 6.0 to 1.0 by increasing the amount of acid catalyst, the average chain length of viscose rayon staple fiber, expressed as the degree of polymerization, decreased from an original value of 286 to 57 at a pH of 2.0. However, the wet strength had suffered no change or had even increased; likewise the relative wet strength showed relatively little change. Had the fiber not been treated with formaldehyde, a D.P. of 57 would result in such low strength properties as to make the fiber worthless for commercial use. The pertinent data, together with other properties of the untreated and treated viscose rayon samples, are shown in Table I.

In practical application, introduction of considerably less methylene, for example 0.5 to 0.8% combined formaldehyde, would suffice to produce the desired effect and, at the same time, retain a greater proportion of original fiber flexibility.

The results of these and numerous other experiments seem to show that the physical strength properties of a regenerated cellulose fiber depend to a much greater extent upon the degree of lateral interlocking between the chain molecules than upon their average length.

TABLE I.—CHANGES IN PROPERTIES OF FORMALDEHYDE-TREATED VISCOSE RAYON STAPLE FIBER

Properties	Untreated	Treated (pH 2.0; Combined CH_2O, 1.02%)
D.P. *	286	57
Tensile, wet	8.1	11.6
Relative wet strength, %	53.8	50.6
Swelling in water, %	86	18
Swelling in alkali, %	577	105
Alkali solubility, %	28.9	1.3
Cuam solubility, %	100	0.8

* Determined on the nitrate. The methylene bridges are eliminated by the nitration acid and an acetone-soluble nitrate is produced, which is suitable for D.P. determination on the basis of viscosity measurements.

This view is supported by the fact that the tensile strength of the formaldehyde-treated fibers decreases to the original value and even to lower values after a treatment with very dilute sulphuric acid at elevated temperature. Under these conditions, the formaldehyde is removed. The decrease in tensile strength below the original value is explained by the hydrolyzing action of the acid upon the glycosidic linkages of the chains. On the basis of the cross-linkage hypothesis, the removal of the formaldehyde would mean the elimination of the methylene bridges as the essential strength-improving factor.

The ability of the formaldehyde to restore physical strength properties which have been lost by degradation is seen from the data in Table II. These data refer to a series of cellulose fiber preparations of decreasing D.P., before and after formaldehyde treatment. In all cases, this treatment resulted in an increase in wet strength.

The data in Table II reveal the additional interesting fact that the gain both in wet strength and relative wet strength is the more pronounced, the lower the D.P. of the fiber preparation. Thus, the greatest improvement is shown by the viscose staple fiber of very low D.P., whereas very little effect is shown by the raw cotton of very high D.P. It would appear as if these differences could be explained on the assumption that the secondary valence forces are weakest for a system of very short chain molecules and vice versa. Hence, the insertion of primary valence cross linkages into a system of very long chains would have relatively little additional effect, whereas the weak system of very short chains may be substantially reinforced. In comparing a genuine with a manufactured fiber, the strength favoring effect of the "bio-structure"—i.e., the fibrillar entanglement of the cotton fiber which the regenerated cellulose fibers lack—must, of course, be taken into consideration.

TABLE II.—RECOVERY OF WET STRENGTH OF CELLULOSIC MATERIALS OF VARYING D.P. BY FORMALDEHYDE TREATMENT

Materials	D.P.	Wet Strength	Relative Wet Strength, %
Staple fiber			
Viscose			
Untreated	87	4.6	46.3
Treated	82	9.7	80.1
Untreated	289	7.6	53.2
Treated	251	10.8	69.3
Cuam			
Untreated	530	9.2	68.3
Treated	322	11.8	88.4
Raw cotton			
Untreated	2760	32.9	99.6
Treated	2600	34.6	94.4

This review of the effect of formaldehyde treatment upon the properties of cellulose would be incomplete without directing attention to the somewhat revolutionary claims of a recent U. S. patent to Kantorowicz *(12)*, which are based upon the alkali solubility reducing effect of the formaldehyde treatment.

It is claimed that ordinary wood pulp, which may contain 12 to 14% of material soluble in strong caustic soda solution of mercerizing strength, is converted into entirely alkali-insoluble pulp by a short treatment with aqueous formaldehyde solution in the presence of nitric acid as a catalyst, removal of the excess liquids, and drying the treated pulp at 120° C. In terms of an arbitrary but generally accepted definition, such a pulp would no longer contain any beta- and gamma-celluloses; it would represent a 100% alpha pulp. It is further claimed that such a pulp may be used for the manufacture of viscose rayon, offering the advantage of high yield and leaving the steeping lye (in the preparation of the alkali cellulose) uncontaminated with hemicelluloses, in much the same way as, or with even better results than, when using alpha pulp of the highest alpha-cellulose content which has been prepared in the usual way. The formaldehyde-treated pulp may also be converted into cellulose acetate with the advantage of high yield and producing clear and nonturbid solutions and films which

cannot be obtained with alpha pulps prepared in the usual way.

In the light of the fact that formaldehyde-treated cellulose has lost much, if not all, of its ability to swell to a great extent in strong aqueous alkali and considering that, thus far, this phenomenon has been looked upon as an indispensable prerequisite for the chemical reaction between the cellulose and the alkali, it is surprising that the nonswelling cellulose should form an alkali compound capable of reacting with carbon disulphide to yield viscose. If it does, it must be concluded that swelling is not always an indispensable necessity for the alkali to react. If swelling is regarded as a means of enlarging the distances between individual chains and, thus, of enabling the alkali molecules, with water as their vehicle, to enter the intramicellar spaces, we may venture to suggest that, with formaldehyde-treated cellulose, it is the methylene bridges which have taken over the function of widening the distances between individual chains to such an extent that we should encounter no difficulties in visualizing the alkali to react, not only with hydroxyl groups located on the micelle surfaces, but also with those in intramicellar positions.

The results reported in the Kantorowicz patent would lead to another somewhat revolutionary conclusion. Hitherto, the opinion has prevailed that the first requirement for making a suitable conversion pulp is to remove from the raw pulp the hemicelluloses —i.e., the short chain cellulosic and the noncellulosic carbohydrate materials, both of which lead to difficulties in processing unpurified pulps and which have an unfavorable effect upon the quality of the finished conversion products. If none of these drawbacks are encountered with formaldehyde-treated pulp, we must conclude that the hemicelluloses, particularly the noncellulosic carbohydrates (i.e., the pentosans and hexosans), are not objectionable as such, and that their only undesirable feature is their limited chain length as compared with that of the alpha-cellulose component, because it impedes the physical strength properties of the finished products. The complete alkali insolubility of the formaldehyde-treated pulp would thus have to be interpreted to mean that the noncellulosic carbohydrate chain molecules are also linked together (and possibly linked with cellulose chains) by methylene bridges and, hence, are relieved of their strength-impeding effect.

It remains to be seen whether the revolutionary claims of the Kantorowicz patent can be verified by other investigators.

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1. Hess, K., and Steurer, E., *Ber.* 73B: 669 (1940).
2. Freudenberg, K., and Boppel, H., *Ber.* 70B: 1542 (1937); 71B: 2505 (1938); Freudenberg, K., Plankenhorn, E., and Boppel, H., *Ber.* 71B: 2435 (1938).
3. Haworth, W. N., *et al., J. Chem. Soc.* 1939: 1885, 1899.
4. Haworth, W. N., *Chemistry and Industry* 58: 917 (1939).
5. Karrer, P., and Escher, E., *Helv. Chim. Acta* 19: 1192 (1936).
6. Stamm, A. J., and Hansen, L. A., *Ind. Eng. Chem.* 29: 831 (1937).
7. Rogovin, S., and Schlachover, M., *Kolloid-Z.* 78: 224 (1937).
8. Yackel, E. C., and Kenyon, W. O., *J. Am. Chem. Soc.* 64: 121 (1942).
9. Malm, C. J., and Fordyce, C. R., *Ind. Eng. Chem.* 32: 407 (1940).
10. Staudinger, H., *Angew. Chem.* 49: 811 (1936).
11. Dillenius, H., *Jentgen's Kunstseide und Zellwolle* 24: 520 (1942).
12. Kantorowicz, J. (Kent, J.), U. S. patent 2,298,260 (Oct. 6, 1942).

Correction

In the article by Delevanti and Hansen, which appeared in the PAPER TRADE JOURNAL for Dec. 27, 1945, the formula in the right hand column of page 28 should read $d = 1.11A/4\pi C$, not $d = 1.11A \times 4\pi C$.

TAPPI Notes

Milton D. Schreiber, formerly of Paper and Industrial Appliances, Inc., is now research chemist for the Flintkote Company, East Rutherford, N. J.

The name of the Central Laboratories, Memphis, Tenn., has been changed to the Buckman Laboratories.

Kon Matchuk, formerly chemist for the Howard Paper Company, is now superintendent of the Maxwell Paper Company, Franklin, Ohio.

Herman L. Joachim is now vice president of the Gibraltar Corrugated Paper Company, North Bergen, N. J.

Paul Anderson, formerly of the Ansco Division of the General Aniline & Film Corporation is now chief chemist for the Bryant Paper Company, Kalamazoo, Mich.

M. Michon of the French Colonial Supply Mission is now visiting the United States. Mr. Michon is purchasing equipment for a mill in French Africa, using tropical woods.

Walter Granville, formerly of the Interchemical Corporation is now color technologist for the Container Corporation of America, 111 W. Washington Street, Chicago, Ill.

Capt. Albert T. Maasburg, C.W.S., is now with the Cellulose Products Div., Dow Chemical Company, Midland, Mich.

John E. Bannan, formerly with the Kalamazoo Vegetable Parchment Company, is now chemist for the Paper Container Mfg. Company, 1735 E. 75th Street, Chicago, Ill.

Charles E. Willis, formerly of Bound Brook, N. J., is now engineer for the Spool Cotton Company, 745 5th Avenue, New York 22, N. Y.

John E. Burdsall, formerly of the Crystal Tissue Company, is now salesman for the Heller & Merz Dept., Calco Chemical Div., American Cyanamid Company, 321 Yankee Road, Middletown 8, Ohio.

N. M. Brisbois of Fiberboard Products, Inc., is now located at 710 Russ Bldg., San Francisco 6, Calif.

Fred C. Shaneman is now President of the Pennsylvania Salt Mfg. Company, Tacoma, Wash.

Eric A. Rinell, formerly of the International Paper Company, is now plant engineer for the Auglaize Box Board Company, St. Marys, Ohio.

Jack Apter, formerly of the Schweitzer Paper Company, is now with the Hudson Pulp & Paper Company, 220 East 42nd Street, New York, N. Y.

Lt. Robert de S. Couch, formerly of the Chicago Quartermaster Depot, is now chief, Packaging Div., Central Laboratories, General Foods, Inc., Hoboken, N. J.

George S. Witham, formerly of the Sandy Hill Iron & Brass Works, is now consultant to the Pulp and Paper Instrument Division of The Bristol Company, Waterbury, Conn.

Russell F. Erickson, formerly of the Hollingsworth & Whitney Company, is now plant engineer for Rayonier, Inc., Fernandina, Fla.

The Chicago Professional Paper Group will meet at the Chicago Bar Association, 29 South La Salle Street, Chicago, Ill., at 6.30 p. m., Monday, January 21, 1946. Ellis Frampton, assistant general sales manager of the Hammermill Paper Company, will talk on New Things Ahead for Paper. A motion picture "The Gift of Ts'ai Lun" will be shown.

The TAPPI Pacific Section will meet at Longview, Wash., on February 5th.

United States Patents of Papermaking

Third and Fourth Quarters, 1945

Compiled by Clarence J. West, Chairman, Committee on Abstracts and Bibliography, TAPPI

The following list of patents has been compiled from the current numbers of the Official Gazette of the United States Patent Office. Because, as a rule, only one claim is published in the Gazette, it is not claimed that the list is complete; also, it is possible that the list may contain some patents that do not apply specifically to pulp and paper manufacture.

Copies of any of the following patents may be obtained from the United States Patent Office, Washington, D. C., by sending ten cents for each patent desired. The number of the patent, the name of the inventor, and the title of the patent should be given in the request. Personal checks and postage stamps are not accepted in payment for patents. Books of coupons may be purchased for two or ten dollars, good for 20 or 100 patents. Coupon orders do not have to be accompanied by letters of transmittal.

July 3, 1945

2,379,411. Method and apparatus for purifying pulp. Andre Bergés, Lorp par St. Lizier, Arriege, France; vested in the Alien Property Custodian. Filed July 5, 1938. 11 claims. (Cl. 92-28). A circular vessel into which pulp is introduced at high speed and adapted to the continuous purification of the pulp.

2,379,443. Process of manufacturing identifiable paper. Morris S. Kantrowitz and Earl J. Gosnell, Washington, D. C. Filed March 15, 1943. 2 claims. (Cl. 92-21). Pulp contains about 0.8% of cellulose fibers which have been impregnated with about 20% of ferric chloride which has been hydrolyzed to ferric hydroxide by heating the suspension to 140°F.

2,379,495. Apparatus for the application of adhesives to webs. Oscar C. Roesen, assignor to Wood Newspaper Machinery Corporation, Plainfield, N. J. Filed Sept. 23, 1941. 8 claims. (Cl. 91-18).

2,379,581. Bark removing machine. Clarence F. Knight, McGrann, Pa. Filed July 20, 1942. 3 claims. (Cl. 144-208).

2,379,665. Folding box. Noah Stone, assignor to Syndicate Products Co., New York, N. Y. Filed June 7, 1943. 2 claims. (Cl. 229-16). A blank for forming into a lunch box and the like.

2,379,726. Folding box. David Levkoff, Brooklyn, N. Y. Filed Dec. 22, 1942. 1 claim. (Cl. 229-37). A folding box formed from a single blank.

2,379,746. Stock regulator for paper machines. Ernest A. Poirier, Waterville, Maine. Filed June 11, 1942. 5 claims. (Cl. 137-68). A vane and a supplemental gate are arranged to change the area of the outlet of the stock.

2,379,755. Method of handling strands. John N. Selvig, assignor to Western Electric Company, Incorporated, New York, N. Y. Filed Aug. 14, 1941. 3 claims. (Cl. 92-41). A means of wrapping a tape of pulp about a wire.

2,379,756. Insulating sheath on electrical conductor strands. John N. Selvig, assignor to Western Electric Company, Incorporated, New York, N. Y. Filed Aug. 14, 1941. 4 claims. (Cl. 174-124). An electric conductor is embedded in a pulp material.

2,379,835. Continuous flow apparatus for testing pulp freeness. Charles O. Sisler, Sault Ste. Marie, Ontario, Canada. Filed Feb. 5, 1944. 6 claims. (Cl. 73-63). The rate of flow of water from the stock on a mesh belt moving at a constant rate of speed is measured.

July 10, 1945

2,379,859. Stamp hinge folding, cutting, and packaging assembly. Charles W. Barnard, Detroit, Mich. Filed July 3, 1941. 12 claims. (Cl. 93-1).

2,379,889. Etherification of lignins and ligninlike materials. Rodger M. Dorland and Robert M. Boehm, assignors to Masonite Corporation, Laurel, Miss. Filed June 20, 1942. 22 claims. (Cl. 106-163). Lignin and an etherifying compound are reacted in the presence of a base and water to form a composition suitable for molding.

2,379,890. Esterification of lignins and ligninlike materials. Rodger M. Dorland and Robert M. Boehm, assignors to Masonite Corporation, Laurel, Miss. Filed June 20, 1942. 22 claims. (Cl. 106-163). Lignin is reacted with aqueous alkali to form an alkali lignin solution, which is then treated with an esterifying compound and heated until the desired degree of esterification is obtained.

2,379,920. Can body maker. John F. Peters, assignor to American Can Company, New York, N. Y. Filed July 8, 1942. 14 claims. (Cl. 93-52). A fiber can body forming machine.

2,379,964. Adhesive sheet material. Edward S. Hole, London, England. Filed April 11, 1942. 2 claims. (Cl. 117-80). Fibrous material is coated on both sides with an adhesive comprising a major portion of gutta percha and a minor portion of rosin, natural gum, and wood pitch, with a plasticizer of petroleum jelly and an insoluble metallic soap.

2,379,986. Tall oil components separation. Emil Ott, assignor to Hercules Powder Company, Wilmington, Del. Filed April 29, 1942. 3 claims. (Cl. 260-97.5). An acetone solution of tall oil is treated with ammonia at a temperature between —10° and 100° C. until reaction with the resin acid component is at least partially complete.

2,380,043. Greaseproof and water repellent paper. Carroll A. Hochwalt, assignor to Monsanto Chemical Company, St. Louis, Mo. Filed Aug. 19, 1942. 5 claims. (Cl. 117-154). The paper contains an *N*-acylated aminobiphenyl where the acyl group is that of fatty acids ranging from C_{12} to C_{20}.

2,380,047. Method of and means for applying coatings. Frank W. Hyman, New York, N. Y. Filed Oct. 3, 1942. 9 claims. (Cl. 117-45). A method of building upon a web a coating of uniform continuity and accurately controlled weight.

2,380,049. Bark peeling machine. George B. Jones, Caspar, Calif. Filed Oct. 6, 1942. 12 claims. (Cl. 144-208).

2,380,195. Safety paper and ink therefor. Burgess W. Smith, assignor to The Todd Company, Inc., Rochester, N. Y. Filed May 19, 1942. 8 claims. (Cl. 117-1).

2,380,252. Treatment of paper machine waste waters. George A. McBride, assignor to Infilco Incorporated, Chicago, Ill. Filed Oct. 31, 1942. 9 claims. (Cl. 210-16). A method of mechanically recovering fibers from suspensions without the use of chemical agents.

July 17 and 24, 1945

No patents issued.

July 31, 1945

2,380,440. Method of making fiber container parts. John M. Hothersall, assignor to American Can Company, New York, N. Y. Filed Dec. 19, 1940. 2 claims. (Cl. 93-1.3). Method of making composite fiber container end members.

2,380,448. Lignin and method of production. Raphael Katzen, assignor to Northwood Chemical Company, Phelps, Wis. Filed Jan. 25, 1941. 7 claims. (Cl. 260-124). Lignin is separated from the product of pressure acid hydrolysis of plant fibers by extraction with an alcohol, such as methanol, ethanol, the propanols, butanols, ethylene glycol ethers, dioxane, methyl or ethyl acetate, acetone, etc.

2,380,462. Can body necking-in machine. John F. Peters, assignor to American Can Company, New York, N. Y. Filed May 21, 1942. 2 claims. (Cl. 93-36).

2,380,504. Process of purifying sulphite liquor. Gösta J. D. Danielsson, assignor to The De Laval Separator Company, New York, N. Y. Filed June 26, 1942. 1 claim. (Cl. 23-131). The sulphite liquor is neutralized and the resulting sludge is removed in a centrifugal machine; the sludge is washed with water and again centrifuged.

2,380,512. Machine for making multiply boards. Jerry U. Forbes, assignor to Container Corporation of America, Chicago, Ill. Filed July 18, 1942. 3 claims. (Cl. 154-37). A means for applying adhesive to two webs and passing them through squeeze rolls.

2,380,527. Apparatus for forming sheets from plastic materials Gilbert A. Hoggatt, assignor to Certain-Teed Products Corporation, Chicago, Ill. Filed Jan. 2, 1943. 2 claims. (Cl. 154-1). A machine for producing wallboard having a core of calcined gypsum.

2,380,706. Production of refined wood pulp. George A. Richter, assignor to Eastman Kodak Company, Rochester, N. Y. Filed May 1, 1942. 8 claims. (Cl. 260-229). Pulp is treated with at least 10% aqueous caustic alkali and then with an aqueous solution of an alkali metal salt of a weak acid at an elevated temperature.

2,380,718. Manufacture of paper for stencil sheets. Irene E. Berkovits, New York, N. Y. Filed Nov. 28, 1940. 12 claims. (Cl. 101-128.2). The paper consists of a thin, flatwise compact sheet of carded, predominantly parallel, long cotton fibers treated with a paper size.

2,380,758. Carton closing mechanism. George I. Hohl, East Orange, N. J. Filed Oct. 28, 1943. 8 claims. (Cl. 93-6).

2,380,762. Manufacture of sheet materials. Ralph G. Jackson, Woodbury, N. J. Filed March 24, 1941. 9 claims. (Cl. 117-8). A decorative sheet is manufactured by piercing the sheet and applying a decorative fluid. It may be used as a floor covering.

2,380,816. Wrapping machine and method. Alexander W. Witbro, assignor to The C. A. Lawton Company, De Pere, Wis. Filed Feb. 20, 1941. 17 claims. (Cl. 93-7). Method of wrapping a toilet roll.

August 7, 1945

2,380,913. Art of packaging. Milton Bennett, assignor to Milprint, Inc., Milwaukee, Wis. Filed Oct. 29, 1942. 2 claims. (Cl. 93-36.01). A bag-in-carton struction.

2,380,914. Art of manufacturing pouches. Clyde K. Billeb, assignor to Milprint, Inc., Milwaukee, Wis. Filed April 12, 1943. 2 claims. (Cl. 93-35). A method of producing pouches from rectangular sheets of heat-sealable material.

2,380,942. Machine for manufacturing molded pulp articles. Merle P. Chaplin, assignor to Chaplin Corporation, Portland, Maine. Filed March 18, 1942. 23 claims. (Cl. 92-56).

2,381,026. Lined carton. William H. Arthur, assignor to Container Corporation of America, Chicago, Ill. Filed Dec. 26, 1942. 7 claims. (Cl. 229-14).

2,381,067. Container. Roy E. Lowey, assignor to Container Corporation of America, Chicago, Ill. Filed July 1, 1943. 3 claims. (Cl. 229-33).

2,381,205. Molding powder and method of making same. Robert A. Caughey, assignor to University of New Hampshire, Durhan, N. H. Filed March 24, 1942. 4 claims. (Cl. 106-163). Wood is treated with a nonoxidizing dilute acidic solution and dried to a moisture content of not more than 1% at a temperature not exceeding 180°F.

2,381,230. Process of cultivating yeast with treated waste sulphite liquor. Nils M. G. Söderström, Spange, and Helge F. Rost, Djursholm, Sweden. Filed April 8, 1943. 14 claims. (Cl. 195-84). The aerated neutralized sulphite waste liquor is freed from colloidal impurities injurious to the yeast.

2,381,269. Process for making thick hardboard. Armin Elmendorf, Winnetka, and Morrin Lieff, Chicago, Ill. Filed Oct. 28, 1941. 4 claims. (Cl. 18-47.5). A mixture of natural lignocellulosic fibers and of partially hydrolyzed lignocellulosic fibers, in the ratio of 1 to 4 to 4 to 1 is dried in an oven and compressed at room temperature and finally at 325 to 400°F. under a pressure of 1000 pounds per square inch.

2,381,286. Stock inlet. Lloyd Hornbostel and Earl E. Berry, assignors to Beloit Iron Works, Beloit, Wis. Filed Feb. 5, 1942. 10 claims. (Cl. 92-44).

2,381,360. Mechanism for cooling freshly coated containers. Charles Z. Monroe, assignor to The American Paper Bottle Company, Toledo, Ohio. Filed May 4, 1943. 6 claims. (Cl. 34-187).

2,381,364. Pressing machine for ends of boxes and covers. Walter P. Osgood, assignor to Boston Machine Works Company, Lynn, Mass. Filed June 25, 1942. 12 claims. (Cl. 93-36.3).

2,381,469. Method of producing can bodies. Willard A. Meyer, assignor to American Can Company, New York, N. Y. Filed May 10, 1941. 4 claims. (Cl. 93-94). Method of forming a multiple ply fiber container body with an inner moisture- and greaseproof liner.

2,381,502. Coating machine. Rudolph C. Lang, assignor to National Biscuit Company, New York, N. Y. Filed July 9, 1940. 30 claims. (Cl. 91-2).

2,381,508. Shipping container. George A. Moore, assignor to National Biscuit Company, New York, N. Y. Filed Sept. 24, 1943. 2 claims. (Cl. 229-43).

2,381,543. Carton partition means. William H. Inman, assignor to Bloomer Bros. Company, Newark, N. J. Filed Jan. 26, 1944. 8 claims. (Cl. 229-28).

2,381,600. Process of making paper. Otto Kress, Frank Zeitlin, and Robert K. Staman, assignors to West Virginia Pulp and Paper Company, New York, N. Y. Filed May 8, 1941. 5 claims. (Cl. 92-21). The broke from calcium sulphite-containing paper is pulped in the presence of air and at a pH of 5 or less and the treated broke is introduced at a point on the machine where the calcium sulphate will not cause objectionable foaming.

2,381,743. Carton-blank handling apparatus for wire-stitching machines. George H. Harred, assignor to Boston Wire Stitcher Company, Portland, Maine. Filed Oct. 7, 1943. 10 claims. (Cl. 271-43).

2,381,766. Apparatus for removing water

from paper webs. Charles W. Mayer (Katherine B. Mayer, executrix), Rochester, N. Y. Filed April 3, 1941. 3 claims. (Cl. 34-95). A series of staggered rolls and scraper rods.

2,381,822. Method of making metal soaps. Paul Hodges, Crossett, Ark., assignor to Gulf States Paper Corporation. Filed Feb. 8, 1943. 5 claims. (Cl. 260-97.5). Crude tall oil soap is reacted with an aqueous solution of a metallic salt.

2,381,850. Method of making bag bodies. Russell J. Williams, assignor to Bemis Bros. Bag. Co., Minneapolis, Minn. Filed June 7, 1943. 1 claim. (Cl. 93-35). Method of forming fold lines in walls of an empty flat bag body.

2,381,851. Method and apparatus for making hood caps. Kenneth R. Allen, assignor to American Seal-Kap Corporation of Delaware, Wilmington, Del. Filed Nov. 24, 1942. 6 claims. (Cl. 93-60). Milk bottle cap.

August 14, 1945

2,381,942. Apparatus for smoothing thermoplastic coating materials. Arthur M. Wickwire, Jr., assignor to Interchemical Corporation, New York, N. Y. Filed Dec. 31, 1941. 2 claims. (Cl. 91-53). The coated surface is subjected to a high temperature flame, the heated coating is smoothed, and the surface is again subjected to the flame.

2,381,955. Envelope machine. Louis Hoffman and August Dalmen, assignors to P. L. Andrews Corporation, Brooklyn, N. Y. Filed Dec. 4, 1943. 5 claims. (Cl. 164-28). A rotatable window-cutting mechanism.

2,381,961. Box-making apparatus. Cutler D. Knowlton, assignor to Hoague-Sprague Corporation, Lynn, Mass. Filed Sept. 21, 1943. 34 claims. (Cl. 91-48).

2,382,010. Process for the treatment of paper mill effluent. Paul Hodges (Lillian F. Hodges, administratrix), Crossett, Ark. Filed Jan. 19, 1942. 9 claims. (Cl. 210-2). Black liquor in a storage reservoir is inoculated with cellulose- and lactic acid-destroying microorganisms, the acid products formed precipitating lignin, fatty acids, and resins.

2,382,035. Container. Isaac L. Wilcox and Raymond Horning, assignors to Oswego Falls Corporation, Fulton, N. Y. Filed June 19, 1943. 2 claims. (Cl. 229-5.7).

2,382,129. Attachment for paper-cutting machines. John R. Brougher, Calvert, Texas. Filed Aug. 30, 1944. 1 claim. (Cl. 164-94).

2,382,202. Collapsible cellular carton. Kenneth T. Buttery, assignor to Sutherland Paper Company, Kalamazoo, Mich. Filed June 27, 1942. 4 claims. (Cl. 229-29).

2,382,240. Carton. L. Lawrence Lesavoy, Allentown, Pa., and Irving Brecher, New York, N. Y. Filed April 25, 1944. 4 claims. (Cl. 229-15).

2,382,297. Floor coverings. Martin E. Cupery, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del. Filed Oct. 21, 1943. 14 claims. (Cl. 106-248). An asphalt-impregnated paper felt base is coated with a synthetic resin.

2,382,308. Carton and package. Theodore C. Gevaart, Kiel, Wis. Filed April 8, 1943. 2 claims. (Cl. 229-14). A cheese box.

2,382,399. Treatment of cellulose. Robert B. Darling, assignor to Hercules Powder Company, Wilmington, Del. Filed June 20, 1941. 10 claims. (Cl. 260-229). In the preparation of cellulose for esterification, the process water, containing 0-100 p.p.m. of dissolved calcium, is treated with a magnesium salt to form a solution containing 5-100 p.p.m. of dissolved magnesium, so as to incorporate within the cellulose from 0.001 to 0.03% of magnesium (by weight of the cellulose).

2,382,536. Package of liquid material and container therefor. Thomas R. Baxter, assignor to Standard Brands Incorporated, New York, N. Y. Filed Aug. 25, 1942. 6 claims. (Cl. 229-14).

2,382,573. Container. George A. Moore, New York, N. Y. Filed March 3, 1943. 5 claims. (Cl. 93-36). A tubular formation to be converted into hermetically sealed packages after filling with food, etc.

2,382,597. Shipping container and dispenser for soda straws and the like. Walter E. Amberg, assignor to Universal Paper Products Company, Chicago, Ill. Filed July 19, 1943. 4 claims. (Cl. 229-7).

2,382,619. Apparatus for conveying freshly coated containers. James F. Earp, assignor to The American Paper Bottle Company, Toledo, Ohio. Filed May 4, 1943. 9 claims. (Cl. 198-131).

2,382,731. Adhesive. Julius G. Little, assignor to Hercules Powder Company, Wilmington, Del. Filed Sept. 26, 1942. 3 claims. (Cl. 260-755). An adhesive for tape contains 160 parts of the trimethylene glycol ester of hydrogenated rosin, 160 parts of rubber, and 125 parts of zinc oxide.

2,382,807. Method and apparatus for bending sheet material. Warren H. Nobles, assignor to Seeger Refrigerator Company, St. Paul, Minn. Filed Sept. 21, 1942. 12 claims. (Cl. 18-19). Method of bending composition board on a convex mandrel.

2,382,819. Container. John R. Richards and Charles W. Evert, assignors to Downing Box Company, Milwaukee, Wis. Filed Feb. 11, 1944. 8 claims. (Cl. 229-44).

2,382,828. Safety record paper. Bernard J. Staneslow, Niagara Falls, N. Y., assignor to Moore Business Forms, Inc. Filed July 31, 1940. 9 claims. (Cl. 117-1). The paper is impregnated with a compound of the group diglycol laurate and glyceryl monoricinoleate.

2,382,844. Bottle carrier. Edwin L. Arneson, assignor to Morris Paper Mills, Chicago, Ill. Filed May 17, 1943. 8 claims. (Cl. 224-45).

2,382,858. Container. Herbert L. Carpenter, assignor to Carpenter Container Corporation, Brooklyn, N. Y. Filed Feb. 1, 1937. 13 claims. (Cl. 229-5.7). A rim for a container.

2,382,873. Paper screw cap. Carl W. Goodwin, assignor to American Seal-Kap Corporation of Delaware, Wilmington, Del. Filed Nov. 11, 1942. 7 claims. (Cl. 215-43).

2,382,890. Process of separating and recovering constituents of tall oil. James F. Loughlin, New York, N. Y. Filed Aug. 1, 1942. 8 claims. (Cl. 260-97.5). The fatty acids are eterified with an aliphatic alcohol containing 4 to 6 carbon atoms, the rosin acids are saponified, and the sodium abietate is recovered by adding a hydrocarbon to the mixture.

2,382,891. Shipping and display high pack container. James A. McCormick, assignor to Fruit & Produce Packing, Inc., Indianapolis, Ind. Filed July 12, 1940. 1 claim. (Cl. 229-37).

2,382,896. Barking machine. Franklin E. Medcoff, Grand Rapids, Mich. Filed Nov. 2, 1944. 1 claim. (Cl. 144-208).

2,382,929. Web pasting apparatus. Russell J. Williams, assignor to Bemis Bros. Bag Company, St. Louis, Mo. Filed May 31, 1943. 3 claims. (Cl. 91-50).

2,382,930. Laminating apparatus. Russell J. Williams, assignor to Bemis Bros. Bag Company, St. Louis, Mo. Filed Oct. 28, 1943. 16 claims. (Cl. 93-18).

August 21, 1945

2,382,987. Packaging. Charles E. Gardner, assignor to Wingfoot Corporation, Wilmington, Del. Filed April 8, 1942. 6 claims. (Cl. 93-3). Method of fluid-tight packaging.

2,383,290. Adjustable closed or sealed container. Herman Carew, assignor to Dixie Cup Company, Easton, Pa. Filed July 17, 1943. 7 claims. (Cl. 220-5.5).

August 28, 1945

2,383,509. Treatment of pigment comprising calcium carbonate. Harold R. Rafton, assignor to Raffold Process Corporation, Andover, Mass. Filed March 25, 1942. 6 claims. (Cl. 106-306). A slurry of calcium carbonate and casein, modified starch, or sodium silicate in water is passed through a nozzle at a velocity of not less than 100 feet per second to effect a reduction in the adhesive requirements of the pigment.

2,383,542. Paper container for dynamite. Edwin A. Godfrey, Sacramento, Calif. Filed March 19, 1943. 4 claims. (Cl. 102-24).

2,383,652. Mailing envelope and insert. Carl A. Holmblad, Flushing, N. Y., and Walter Englund, Atlanta, Ga. Filed May 1, 1944. 4 claims. (Cl. 229-68).

2,383,660. Method of transparentizing paper. Julius G. Little, assignor to Hercules Powder Company, Wilmington, Del. Filed Sept. 25, 1942. 1 claim. (Cl. 117-158). The paper is impregnated with a 37.5% solution of a triethylene glycol ester of hydrogenated rosin in ethyl acetate and dried after removing excess solution.

2,383,684. Process of continuous alkali treatment of fibrous material. John C. F. C. Richter, assignor to Aktiebolaget Kamyr, Karlstad, Sweden. Filed April 29, 1942. 2 claims. (Cl. 92-13). The water in the fibrous material is displaced with alkali liquor and additional liquor is added to uniformly distribute the alkali throughout the material and to produce a flowing liquid, which is then passed through a reaction chamber.

2,383,728. Package. John W. Little, assignor to Sylvania Industrial Corporation, Fredericksburg, Va. Filed Aug. 19, 1942. 3 claims. (Cl. 229-51). A wrapper and a tear strip therefor.

2,383,742. Thickness measuring device. Joseph W. Russell, assignor to Nashua Manufacturing Company, Nashua, N. H. Filed Feb. 18, 1943. 6 claims. (Cl. 33-147).

2,383,760. Cover for paper containers. Cesare Barbieri, assignor to Dixie Cup Company, Easton, Pa. Filed Jan. 27, 1943. 1 claim. (Cl. 229-5.5).

2,383,797. Machine for making decorative paper strips. Perley A. Hilliard, Newton Center, Mass. Filed Sept. 28, 1943. 8 claims. (Cl. 93-1). Means for cutting finger-like sections and crimping the end edge thereof.

2,383,842. Bag forming machine. Samuel H. Berch, assignor to The Flexible Vacuum Container Corporation, Los Angeles, Calif. Filed Feb. 16, 1942. 3 claims. (Cl. 271-2.1).

2,383,849. Method and apparatus for making sheet material. Clarence J. Davies, assignor to National Automotive Fibres, Inc., Detroit, Mich. Filed March 11, 1940. 11 claims. (Cl. 154-1). A mixture of loosely aggregated fibrous material and a thermoplastic binder is heated, compressed to the desired thickness, and the surface is ironed without compacting the body of the sheet.

2,383,853. Container. Reynolds Guyer, assignor to Waldorf Paper Products Company, St. Paul, Minn. Filed Feb. 16, 1942. 10 claims. (Cl. 229-16).

2,383,879. Abrasive paper rolls. Hugo Mock, New York, N. Y. Filed Jan. 10, 1945. 2 claims. (Cl. 51-306). A thin layer of wax is applied to an absorbent paper sheet, followed by a powdered abrasive.

September 4, 1945

2,384,015. Thermosetting plastic material. Le Grand Daly, Port Clinton, Ohio. Filed June 4, 1941. 4 claims. (Cl. 260-9). The material has lignin as one of the filler ingredients.

2,384,021. Adhesive applying system. Theodore A. Federwitz and Hans Grotewold, assignors to Stokes & Smith Company, Philadelphia, Pa. Filed June 13, 1941. 26 claims. (Cl. 93-56).

2,384,076. Carton. John W. Cox, assignor to Self-Locking Carton Co., Chicago, Ill. Filed March 1, 1943. 1 claim. (Cl. 229-29).

2,384,231. Apparatus for applying sheet material to other materials. Arthur P. Bamford, assignor to Arkell & Smiths, Inc., Canajoharie, N. Y.

2,384,326. Paper pulping apparatus. Homer D. Martindale, assignor to The Black-Clawson Company, Hamilton, Ohio. Filed Aug. 27, 1941. 6 claims. (Cl. 92-23). The cylindrical tank contains a horizontal pulping member rotating at approximately 2000 to 6000 feet per minute; the diameter of the pulping member is about twice the diameter of the screen and the diameter of the tank is three or more times the diameter of the screen.

September 11, 1945

2,384,500. Apparatus and method of coating. Charles C. Stoll, assignor to Crown Cork & Seal Company, Inc., Baltimore, Md. Filed July 8, 1942. 4 claims. (Cl. 117-119). A method of coating in a vacuum.

2,384,559. Collapsible box structure. Francis V. Powell, assignor to Lindley Box & Paper Company, Marion, Ind. Filed May 19, 1944. 4 claims. (Cl. 229-41).

2,384,632. Manufacture of paper of good wet strength. Kenneth J. MacKenzie and Robert S. Bryce, assignors to Eastman Kodak Company, Rochester, N. Y. Filed Dec. 10, 1940. 4 claims. (Cl. 95-8). The paper contains 1 to 10% of a water-soluble polymeric reaction product of polyhydric alcohol and boric acid and not more than 5% of a water-dispersible paper-sizing material.

2,384,671. Coating composition and the like. Joseph E. Fratis, assignor to California Research Corporation, San Francisco, Calif. Filed March 24, 1943. 8 claims. (Cl. 106-280). Asphalt, 5 to 35% of mica (based on the weight of the mixture), and a thinner.

2,384,676. Method and machine for making composite boards. Irving Hill, Lawrence, Kans. Filed Dec. 26, 1942. 4 claims. (Cl. 154-31). Method of forming a corrugated sheet.

2,384,768. Apparatus for combining sheets. Harry A. Rau, assignor to Crown Cork & Seal Company, Inc., Baltimore, Md. Filed June 26, 1941. 10 claims. (Cl. 154-36). Method for adhesively uniting paper and metal sheets.

September 18, 1945

2,384,853. Preparation of wood pulp for nitration. William E. Sillick, assignor to Eastman Kodak Company, Rochester, N. Y. Filed Feb. 24, 1943. 5 claims. (Cl. 260-222). The pulp is passed through a disintegrating mill and lightly pressed, so that it has a bulk value of approximately 700 units.

2,384,912. Stock inlet. Francis A. Helin, assignor to The Bagley and Sewall Company, Watertown, N. Y. Filed May 8, 1943. 14 claims. (Cl. 92-44).

2,384,958. Method of and apparatus for making fibrous articles. Victor T. Paré, assignor to Radio Corporation of America, New York, N. Y. Filed Oct. 14, 1941. 4 claims. (Cl. 92-54).

2,385,145. Process for making containers from paper pulp and apparatus therefor. Raymond E. MacDonald, Westwood, Mass., assignor of one-half to Edwin M. Warwick, Walpole, Mass. Filed Aug. 21, 1939. 31 claims. (Cl. 92-56).

2,385,147. Device for forming containers of flexible material. Raymond E. MacDonald, Westwood, Mass., assignor of one-half to Edwin M. Warwick, Walpole, Mass. Filed July 3, 1944. 26 claims. (Cl. 18-19). Containers are shaped from paper pulp.

2,385,229. Method and apparatus for producing bags. William S. Patterson, assignor to Pneumatic Scale Corporation, Limited, Quincy, Mass. Filed Oct. 11, 1941. 14 claims. (Cl. 93-3).

2,385,230. Method of and apparatus for forming tubular articles. Eugene L. Perry, assignor to Universal Winding Company, Boston, Mass. Filed Aug. 12, 1942. 25 claims. (Cl. 92-66).

2,385,255. Bag closure. Charles V. Brady, assignor to Bemis Bros. Bag Co., St. Louis, Mo. Filed Aug. 13, 1943. 10 claims. (Cl.

229-63).

3,385,259. Purification of wood pulp. William R. Collings, Richard D. Freeman, Martin J. Roberts, and Willis O. Hisey, assignors to The Dow Chemical Company, Midland, Mich. Filed May 10, 1943. 2 claims. (Cl. 92-13). A cold purification process for the production of at least 97% alpha-cellulose from wood pulp, in which the pulp is first treated with 8 to 15% sodium hydroxide as a consistency of 7 to 15%, and then with a 1.5 to 2.5% caustic solution.

SEPTEMBER 25, 1945

2,385,379. Manufacture of pigments and products made therewith. Harold R. Rafton, assignor to Raffold Process Corporation, Andover, Mass. Filed July 20, 1940. 19 claims. (Cl. 106-306). Calcium carbonate pigment is subjected to pressure of not less than 25 pounds per linear inch to reduce its oil absorption and its adhesive requirement.

2,385,438. Starch product. George B. Fowler and Donald K. Pattilloch, Springfield, Mass.; said Pattilloch assignor to Chemical Development, Inc., Chicago, Ill. Filed Sept. 27, 1941. 5 claims. (Cl. 260-9). A tough starch gel precipitable with aluminum sulphate is prepared from 40 parts of starch in 480 parts of water containing 50 parts of a urea-formaldehyde resin and 28 parts of sodium metasilicate in 120 parts of water.

2,385,560. Method of testing a pigment. John K. Wise, assignor to United States Gypsum Company, Chicago, Ill. Filed June 16, 1941. 4 claims. (Cl. 23-230). This is a test for a pigment to be used with a urea-formaldehyde condensation product.

2,385,583. Machine for sealing waxed paper bags. Arthur B. McLauchlan, Salem, Oreg. Filed May 18, 1942. 2 claims. (Cl. 226-56).

2,385,586. Condensation of phenols with sulphite waste liquor. Hermann Rudy and Rudolf Watzel, Mannheim, Germany; vested in the Alien Property Custodian. Filed March 13, 1942. 3 claims. (Cl. 260-17.5). A mixture of pulverized sulphite waste liquor solids, a phenol, and anhydrous phosphoric acid (initial mixture below pH 4) is reacted at 70° to 130° C. The resulting resin is readily soluble in water.

2,385,597. Handle defining closure for paper bags. Howard G. Allen, assignor to Consolidated Packaging Machinery Corporation, Buffalo, N. Y. Filed July 3, 1940. 6 claims. (Cl. 229-62).

2,385,598. Bag closing machine. Howard G. Allen, assignor to Consolidated Packaging Machinery Corporation, Buffalo, N. Y. Filed June 23, 1943. 7 claims. (Cl. 93-6).

2,385,604. Machine for producing containers and parts thereof. Clarence T. Brewer, assignor to Dixie Cup Company, Easton, Pa. Filed June 2, 1938. 46 claims. (Cl. 93-36.2).

2,385,646. Method of making album bags. George W. Poppe, assignor to Equitable Paper Bag Co., Inc., Long Island City, N. Y. Filed April 28, 1942. 4 claims. (Cl. 93-35).

2,385,647. Bag. George W. Poppe, assignor to Equitable Paper Bag Co., Inc., Long Island City, N. Y. Filed Dec. 3, 1943. 1 claim. (Cl. 229-57). A bag consisting of a bellows fold tube.

2,385,691. Continuous winding machine. Wesley S. Corbin, Francis Chilson, Paul L. Tollison, Charles S. Caffrey, and Alfred F. Pilon, assignors to Scott Paper Company, Chester, Pa. Filed March 12, 1942. 42 claims. (Cl. 242-56). An apparatus for winding individual rolls for a web.

2,385,692. Continuous winding machine. Wesley S. Corbin, Paul L. Tollison, Alfred F. Pilon, Francis Chilson, and Charles S. Caffrey, assignors to Scott Paper Company, Chester, Pa. Filed April 7, 1942. 35 claims. (Cl. 242-56). An apparatus for winding individual rolls from a web.

2,385,751. Package sealing strip applying mechanism. Leon V. Whipple and Samuel W. Pollock, assignors to American Machine and Foundry Company, New York, N. Y. Filed Feb. 12, 1942. 37 claims. (Cl. 93-2).

2,385,764. Sap-stain control. Roland Smith, assignor to Monsanto Chemical Company, St. Louis, Mo. Filed Feb. 7, 1942. 3 claims. (Cl. 167-38.7). A mixture of sodium 8-quinolinolate and sodium pentachlorophenate is used.

OCTOBER 2, 1945

2,385,793. Printing ink. Everett P. Carman and Walther Reil, assignors to Interchemical Corporation, New York, N. Y. Filed Feb. 7, 1942. 3 claims. (Cl. 106-29). The pigment is dispersed in an aqueous dispersion of a trialkylol amine soap as tall oil.

2,385,794. High free rosin size dispersions. Fred L. Chappell, Jr., assignor to Hercules Powder Company, Wilmington, Del. Filed April 24, 1941. 19 claims. (Cl. 106-144). An aqueous dispersion of saponified rosin is treated with an organic acid anhydride capable of hydrolyzing the saponified rosin in aqueous solution.

2,385,809. Drying apparatus. Ray L. Hooper, assignor to Ecusta Paper Corporation, Pisgah Forest, N. C. Filed Nov. 11, 1942. 2 claims. (Cl. 34-193). An apparatus for determining the moisture content of pulp samples.

2,385,898. Snap-down bottom, flat-folded paperboard container. Harry F. Waters, New York, N. Y. Filed June 24, 1943. 7 claims. (Cl. 229-16).

2,385,912. Sulphurized glyceryl esters of tall oil and method for making same. Gifford D. Davis and Edwin J. Barth, assignors to National Oil Products Company, Harrison, N. J. Filed June 3, 1943. 5 claims. (Cl. 260-97.5).

2,385,916. Apparatus for impregnating webs. Leonard H. Hahn, assignor to Certain-Teed Products Corporation, New York, N. Y. Filed July 12, 1940. 7 claims. (Cl. 91-18).

2,385,955. Manufacture of sulphite pulp. George H. Tomlinson, Westmount, Quebec, Canada. Filed April 8, 1941. 13 claims. (Cl. 23-131). A method is given for the utilization of waste sulphite liquor obtained from pulping with a magnesium-base sulphite cooking acid.

2,386,033. Dry size. Fred L. Chappell, Jr., assignor to Hercules Powder Company, Wilmington, Del. Filed Sept. 1, 1943. 18 claims. (Cl. 106-144). This consists of a substantially neutral dry alkali metal saponified rosin size and a solid organic acid anhydride at a pH above 6.0.

2,386,062. Package for rolls of flexible material. Bruno C. Roehrl, assignor to General Aniline & Film Corporation, New York, N. Y. Filed Sept. 9, 1943. 3 claims. (Cl. 229-14).

2,386,156. Air doctor. Faunce C. Woodward, assignor to S. D. Warren Company, Boston, Mass. Filed Jan. 25, 1943. 7 claims. (Cl. 91-53). The air doctor is comprised of two throat-forming members.

OCTOBER 9, 1945

2,386,584. Reverse press section for papermaking machines. Earl E. Berry, assignor to Beloit Iron Works, Beloit, Wis. Filed Dec. 2, 1940. 2 claims. (Cl. 92-49).

2,386,632. Stock selecting apparatus for use with paper machines. Ernest A. Poirier, Waterville, Maine. Filed May 19, 1942. 6 claims. (Cl. 92-28). An apparatus for removing dirt from paper stock.

2,386,700. Coated paper. Frank H. Manchester, assignor to Wingfoot Corporation, Akron, Ohio. Filed Nov. 20, 1943. 2 claims. (Cl. 117-155). Paper is coated with a mixture of 5 to 95 parts of rubber hydrochloride and 5 to 95 parts of a copolymer of vinyl chloride and vinylidene chloride.

OCTOBER 16, 1945

2,386,780. Sheeted cellulosic material and abrasive article and process of making the same. Bert S. Cross, assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn. Filed Dec. 30, 1940. 11 claims. (Cl. 154-50).

2,386,792. Apparatus for producing fibrous filters. Frank B. Hale and Oliver I. Gaines, Edgewood Arsenal, Md., assignors to The Secretary of War of the United States. Filed March 30, 1931. 3 claims. (Cl. 92-56). An apparatus for producing sucked-on filters for gas mask canisters.

2,386,905. Carton and carton blank. Curt J. Meitzen, Wauwatosa, Wis. Filed Dec. 26, 1942. 9 claims. (Cl. 229-49).

2,387,184. Cover construction for containers. John R. Richards and Charles M. Evert, assignors to Downing Box Company, Milwaukee, Wis. Filed July 20, 1944. 14 claims. (Cl. 229-44).

2,387,217. Wrapper. Everette C. Scott, assignor to Industrial Patents Corporation, Chicago, Ill. Filed Jan. 22, 1943. 3 claims. (Cl. 22987). A flexible heat insulating wrapper.

OCTOBER 23, 1945

2,387,272. Method of forming cardboard boxes. Clarence F. Klein and Edgar Huber, assignors to Frankenberg Bros., Inc., Columbus, Ohio. Filed June 25, 1942. 7 claims. (Cl. 93-36.01).

2,387,273. Coating apparatus. Alfred L. Kronquest, assignor to Continental Can Company, Inc., New York, N. Y. Filed Oct. 11, 1943. 9 claims. (Cl. 91-44).

2,387,274. Method of and apparatus for producing valved or sleeved bags. Harry E. Lee, assignor to St. Regis Paper Company, New York, N. Y. Filed April 17, 1945. 32 claims. (Cl. 93-8).

2,387,314. Carton. John W. Cox, assignor to Self-Locking Carton Co., Chicago, Ill. Filed Dec. 22, 1941. 2 claims. (Cl. 229-28).

2,387,325. Container. Charles H. Goodyear, assignor to Fibreboard Products, Inc., San Francisco, Calif. Filed Oct. 4, 1940. 8 claims. (Cl. 229-51).

2,387,329. Container with handle. Arthur C. Jacobs, Chicago, Ill. Filed May 29, 1943. 4 claims. (Cl. 229-52).

2,387,392. Method of constructing containers. Reynolds Guyer and Russell J. Hennessey, assignors to Waldorf Paper Products Company, St. Paul, Minn. Filed Nov. 6, 1942. 3 claims. (Cl. 93-39.1).

2,387,421. Drive for paper manufacturing machines. Alfred Vanden Bergh, Green Bay, Wis. Filed Feb. 28, 1944. 1 claim. (Cl. 74-55). Drive for a pulp screen.

2,387,429. Glassine paper. Paul H. Cate, assignor to Kelco Company, San Diego, Calif. Filed Oct. 21, 1940. 3 claims. (Cl. 92-3). A glassine paper contains glycerin and about 0.3% of an alginate to render it oil resistant and transparent.

2,387,484. Box. Joseph H. Vineberg, Ottawa, Canada. Filed March 24, 1944. 3 claims. (Cl. 229-23).

2,387,619. Production of synthetic tanning material. J. Seidel and Helmut Weber, Germany; vested in the Alien Property Custodian. Filed April 8, 1941. 5 claims. (Cl. 260-9). Sulphite waste liquor is treated with about 5% of an acid which will form soluble calcium compounds, a phenol, a carbohydrate (starch or dextrin), and the mixture is reacted with an aldehyde or ketone.

2,387,631. Means for forming laminated sheet bodies. Francis M. Weir, Essex, Conn. Filed Nov. 27, 1943. 2 claims. (Cl. 144-279).

2,387,683. Production of resinous felted fibrous composition. Herman W. Richter and Harold R. Gillette, assignors to Federal Electric Company, Inc., Chicago, Ill. Filed Nov. 17, 1941. 2 claims. (Cl. 92-55). Pulp fibers and a thermoplastic resin are molded at 220 to 250° F. and a pressure of from 100 to 2000 pounds per square inch.

OCTOBER 30, 1945

2,387,773. Hot-melt coating composition. Martin Salo and Harold F. Vivian, assignors to Eastman Kodak Company, Rochester, N. Y. Filed Nov. 27, 1943. 10 claims. (Cl. 106-178). The composition consists of cellulose acetate butyrate and from 25 to 100% of a mixture of dibutyl sebacate and butyl stearate.

2,387,774. Hot-melt coating composition. Martin Salo and Harold F. Vivian, assignors to Eastman Kodak Company, Rochester, N. Y. Filed Nov. 27, 1943. 8 claims. (Cl. 106-178). The composition consists of cellulose acetate butyrate and 25 to 100% of di-2-ethylhexyl phthalate and butyl stearate.

2,387,790. Multicompartment carton. Marshall I. Williamson, New Haven, Conn. Filed May 6, 1943. 14 claims. (Cl. 229-27).

2,387,865. Fire-retarding coating. Arthur Van Kleeck, Madison, Wis. Filed July 21, 1943. 1 claim. (Cl. 106-15). The composition consists of 40 parts of an alkali alginate gel (2% by weight), 30 parts of borax, and 30 parts of boric acid.

2,387,929. Gluing mechanism. Charles Z. Monroe, assignor to The American Paper Bottle Company, Toledo, Ohio. Filed Aug. 13, 1941. 3 claims. (Cl. 91-49).

2,388,012. Method of making match pockets. Rodney S. Pullen, assignor to Pullenlite Company, Philadelphia, Pa. Filed June 26, 1943. 10 claims. (Cl. 93-2).

2,388,168. Dispensing carton. Frank A. Marx, assignor to The Richardson Taylor-Globe Corporation, Cincinnati, Ohio. Filed May 14, 1943. 2 claims. (Cl. 229-11).

2,388,190. Foldable cardboard box. Ralph F. Smart, assignor to Meade Hyndman, Highland, Ill. Filed Feb. 22, 1943. 1 claim. Cl. 229-39).

NOVEMBER 6, 1945

2,388,243. Carton. Edwin L. Arneson, assignor to Morris Paper Mills, Chicago, Ill. Filed Dec. 9, 1942. 5 claims. (Cl. 229-31).

2,388,266. Apparatus for producing stayed boxes. Malcolm P. Junkin, Drexel Hill, Pa. Filed Aug. 21, 1941. 4 claims. (Cl. 93-56). Apparatus for securing a thermoplastic stay about the corners of a box.

2,388,267. Box. Malcolm P. Junkin, Drexel Hill, Pa. Filed March 16, 1942. 4 claims. (Cl. 229-49).

2,388,277. Fibrous container. Harold E. McCrery, assignor to Plyfiber Container Corporation, Garwood, N. J. Filed Feb. 1, 1941. 8 claims. (Cl. 229-4.5).

2,388,288. Joinders in sheet materials. William A. Rongler and Marshall I. Williamson, assignors to Wedglok Corporation, New York, N. Y. Filed Sept. 16, 1942. 4 claims. (Cl. 229-35).

2,388,326. Moistureproof sheet. William L. Hyden and James A. Mitchell, assignors to E. I. du Pont de Nemours & Company, Wilmington, Del. Filed Jan. 27, 1943. 8 claims. (Cl. 117-145). The moistureproofing composition contains from 0.05 to 10% by weight, of finely divided 1, 2-dihydronaphthalene polymer.

2,388,339. Method of coating paper. Clarence Paxton and Thomas H. Vail, assignors to The Champion Paper and Fibre Company, Hamilton, Ohio. Filed April 21, 1942. 5 claims. (Cl. 117-64). The aqueous suspension of mineral pigment and adhesive is spread and smoothed, while in a fluent state, by reversely turning rolls and the paper is steamed in the zone where the rolls contact the paper.

2,388,392. Ironing apparatus. Clarence J. Davies, assignor to National Automotive Fibres, Inc., Detroit, Mich. Filed July 26, 1943. 3 claims. (Cl. 154-27). An apparatus for smoothing a surface of fibrous sheet material as the latter is advanced in a given direction.

2,388,412. Fractionation of tall oil. Arthur W. Hixson and Ralph Miller, assignors to The Chemical Foundation, Incorporated, New York, N. Y. Filed April 25, 1940. 5 claims. (Cl. 260-97.5). Fatty acids are separated from tall

oil by extraction with a liquefied, normally gaseous hydrocarbon at elevated temperature.

2,388,433. Apparatus for folding, banding, and mounting paper tickets. Robert F. Palmer, Wheeling, W. Va. Filed July 20, 1942. 24 claims. (Cl. 93-1).

2,388,487. Process of making compressed fiber products. Harry K. Linzell, assignor to United States Gypsum Company, Chicago, Ill. Filed Jan. 22, 1940. 8 claims. (Cl. 92-40). Lignocellulosic material (initially containing not over 5% of moisture) is treated under pressure at a temperature above 350° F. in the presence of a ferric compound.

2,388,526. Method of preparing a coating composition. Willim L. Craig, assignor to R. T. Vanderbilt Company, Inc., New York, N. Y. Filed Dec. 11, 1941. 3 claims. (Cl. 106-214). Raw starch is incorporated into an aqueous suspension of a mineral or pigment and the mixture is subjected to the action of a liquefying enzyme.

2,388,592. Process of making lignocellulose pulps from straw. Arne J. A. Asplund and Johan W. Holst, assignors to Aktiebolaget Defibrator, Stockholm, Sweden. Filed Sept. 26, 1940. 3 claims. (Cl. 92-6). Straw is impregnated with from 0.5 to 3% of mineral acid (pH 1 to 4), subjected to an atmosphere of steam at from 270° to 380° F. and the corresponding pressure for 20 to 180 seconds, and mechanically defibrated while still in the presence of the acid and steam atmosphere.

2,388,627. Papermaking apparatus. George S. Witham, Hudson Falls, N. Y. Filed Oct. 9, 1940. 1 claim. (Cl. 92-46). A method of controlling the consistency of paper stock in a vat.

November 13, 1945

2,388,727. Glossmeter. Edward C. Dench, assignor to Interchemical Corporation, New York, N. Y. Filed May 29, 1942. 2 claims. (Cl. 88-14).

2,388,745. Paper twine and the method of producing the same. Morris Katz, Bronx, N. Y. Filed March 26, 1943. 2 claims. (Cl. 57-155). Method of twisting paper strands.

2,388,828. Machine for manufacturing molded pulp articles. Merle P. Chaplin, assignor to Chaplin Corporation, Portland, Maine. Filed May 2, 1942. 3 claims. (Cl. 92-56).

2,388,910. Adhesives and their manufacture. Eric W. Eweson, New York, N. Y. Filed Sept. 25, 1942. 9 claims. (Cl. 106-124). Yeast is produced from sulphite waste liquor free from alcohol but in the presence of lignin and heated at a temperature of 160° to 220° F. to sterilize, agglutinize, and break down the cell walls of the yeast.

2,388,911. Apparatus for applying adhesive to container body ends. Henry A. Fink, assignor to Continental Can Company, Inc., New York, N. Y. Filed Jan. 27, 1944. 15 claims. (Cl. 91-50).

2,389,024. Means for forming fiber felts. Robert N. Brownlee, assignor to Wood Conversion Company, Cloquet, Minn. Filed Aug. 10, 1942. 13 claims. (Cl. 19-156).

November 20, 1945

2,389,203. Condensed halogenated tall oil products and method for making the same. Eugene Lieber, assignor to Standard Oil Development, Linden, N. J. Filed July 19, 1940. 9 claims. (Cl. 260-97.5). A wax modifier is formed by the reaction of 1 part of halogenated tall oil and 3 to 4 parts of an aromatic organic compound in the presence of aluminum chloride.

2,389,222. Carton. John E. Walsh, assignor to Self-Locking Carton Co., Chicago, Ill. Filed Dec. 2, 1943. 5 claims. (Cl. 229-28).

2,389,254. Manufacture of paper. Maurice A. Goldman, assignor to Saco-Lowell-Shops, Biddeford, Maine. Filed Sept. 27, 1940. 2 claims. (Cl. 8-119). Dry cellulose fibers in the form of a web are treated with a quickly acting gelatinizing solution and as soon as the surface of the cellulose is gelatinized the fibers are compacted by pressure.

2,389,284. Selectively hydrogenated tall oil and method of making same. Joseph A. V. Turck, Jr., and John Ross, assignors to Colgate-Palmolive-Peet Company, Jersey City, N. J. Filed July 5, 1940. 11 claims. (Cl. 260-97.5). Tall oil is treated with hydrogen at a pressure of at least 50 pounds per square inch in the presence of a nickel catalyst and at a temperature above 50° but below 135° C.

2,389,291. Carton with removable liner. Robert M. Bergstein, assignor to Robert M. Bergstein and Frank D. Bergstein, trustees, Cincinnati, Ohio. Filed June 12, 1944. 13 claims. (Cl. 229-14).

2,389,318. Bottle holder. Samuel N. Lebold, assignor to Morris Paper Mills, Chicago, Ill. Filed July 12, 1944. 7 claims. (Cl. 229-52).

2,389,465. Composition for storage battery plates and method of preparing same. Alexander Stewart and Adrian R. Pitrot, assignors to National Lead Company, New York, N. Y. Filed Sept. 25, 1941. 7 claims. (Cl. 136-26). A solution containing alkaline lignin is neutralized to pH 7 to 10, and the portion of the lignin which is precipitated is separated, washed, and dried.

2,389,534. Closure for paper containers. Frank J. O'Brien, assignor to Continental Can Company, Inc., New York, N. Y. Filed Nov. 19, 1943. 4 claims. (Cl. 229-5.6).

2,389,547. Cylindrical container and the like. William A. Ringler, assignor to The Gardner-Richardson Company, Middletown, Ohio. Filed Dec. 1, 1942. 5 claims. (Cl. 229-5.5).

2,389,580. Knockdown box. Herbert C. Skell, assignor to The Hinde & Dauch Paper Company, Sandusky, Ohio. Filed Aug. 4, 1943. 2 claims. (Cl. 229-23).

November 27, 1945

2,389,601. Receptacle and method of making it. William J. De Witt, assignor to Shoe Form Co., Inc., Auburn, N. Y. Filed Aug. 6, 1943. 2 claims. (Cl. 229-23).

2,389,678. Powder fiber sheet. Edwin J. Merrell, assignor to Phelps Dodge Copper Products Corporation, Dover, Del. Filed Feb. 5, 1943. 1 claim. (Cl. 92-3). A fiber mesh of undercooked sulphate pulp beaten to a slowness of 300 to 500 cc. contains 37 to 51% of submicroscopic silicon carbide and forms a high porosity flexible sheet of high tensile strength.

2,389,703. Carton. Robert Van Rosen, assignor to J. Makowsky Corporation, New York, N. Y. Filed June 12, 1944. 11 claims. (Cl. 229-16).

2,389,733. Articles formed from paper impregnated with polymerized material. Edwin C. Lee, assignor to International Standard Electric Corporation, New York, N. Y. Filed July 10, 1941. 12 claims. (Cl. 175-21). Method of making a coil.

2,389,747. Envelope. Ralph K. Stone and Frank O. Broughton, assignors to United States Envelope Company, Springfield, Mass. Filed April 5, 1943. 2 claims. (Cl. 206-63.2). An envelope adapted to shaking or sifting granular material.

2,389,748. Envelope. Willard E. Swift, assignor to United States Envelope Company, Springfield, Mass. Filed Jan. 2, 1943. 2 claims. (Cl. 229-84).

2,389,890. Container. John E. Borah, Penn Township, St. Joseph Co., Ind. Filed March 1, 1943. 14 claims. (Cl. 229-23).

December 4, 1945

2,390,045. Method of making composite siding and roofing. Floyd W. Adams, assignor to The Celotex Corporation, Chicago, Ill. Filed March 21, 1941. 2 claims. (Cl. 154-2).

2,390,063. Process for the preparation of products from lignin O by hydrogenation. Karl Freudenberg and Willy Lautsch, Heidelberg, Germany; vested in the Alien Property Custodian. Filed Sept. 19, 1940. 6 claims. (Cl. 260-124). Alkali lignin in an aqueous alkaline medium is reacted under pressure with hydrogen at a temperature of 250° to 420° C., the hydrogen pressure ranging from 30 to 120 atmospheres.

2,390,064. Paper hat. Irving Gardner, Brooklyn, N. Y. Filed Sept. 30, 1944. 7 claims. (Cl. 2-195).

2,390,071. Infusion package manufacture. Louis Barnett, assignor to National Urn Bag Company, Inc., Long Island City, N. Y. Filed Oct. 9, 1941. 11 claims. (Cl. 93-3).

2,390,072. Method of producing a potential opening in a fiber container or other fiber article. Robert G. Beaton, assignor to American Can Company, New York, N. Y. Filed March 18, 1944. 4 claims. (Cl. 164-125).

2,390,107. Packaging machine. Fred W. Kucklinsky, assignor to Ester M. Kucklinsky, Montclair, N. J. Filed Aug. 28, 1941. 2 claims. (Cl. 93-6). Machine for closing and sealing a rectangular carton.

2,390,118. Coating machine. John H. Murch, assignor to American Can Company, New York, N. Y. Filed Sept. 11, 1942. 10 claims. (Cl. 91-53). Machine for coating fiber containers with liquid paraffin wax and the like.

2,390,208. Heating apparatus. Clarence J. Davies, assignor to National Automotive Fibres, Inc., Detroit, Mich. Filed July 26, 1943. 15 claims. (Cl. 154-27). A heating chamber for boards.

2,390,348. Building covering. James E. Black, assignor to Black Systems, Chicago, Ill. Filed March 4, 1944. 4 claims. (Cl. 108-7). A shingle unit.

2,390,351. Process for making jordan engine linings. Archer L. Bolton, assignor to John W. Bolton & Sons, Inc., North Andover, Mass. Filed July 28, 1941. 1 claim. (Cl. 18-59).

2,390,392. Carton and carton blank. Arthur Rous, New York, N. Y. Filed April 7, 1944. 2 claims. (Cl. 229-17).

2,390,412. Carton. Arthur H. Axberg, Bayside, N. Y. Filed July 12, 1944. 2 claims. (Cl. 229-51).

2,390,426. Machine for perforating, slitting, or scoring sheets. John A. Davidson, Brooklyn, N. Y. Filed Nov. 18, 1944. 13 claims. (Cl. 164-99).

2,390,457. Apparatus for spraying container parts. Paul E. Pearson and Alfred Treff, assignors to Continental Can Company, Inc., New York, N. Y. Filed May 7, 1942. 40 claims. (Cl. 91-45).

2,390,459. Apparatus for debarking and cleaning logs. Michael J. Power, Nekoosa, Wis. Filed Aug. 1, 1940. 21 claims. (Cl. 144-208).

December 11, 1945

2,390,510. Adhesive testing device. Clarence K. Chatten, Jackson Heights, N. Y. Filed Feb. 19, 1945. 5 claims. (Cl. 73-150). A device for testing the strength of adhesion between bonded layers.

2,390,550. Apparatus for sealing containers. George A. Moore, assignor to Shellmar Products Company, Mount Vernon, Ohio. Filed Aug. 4, 1941. 1 claim. (Cl. 154-42).

2,390,692. Papermaking machine press roll assembly. Everett W. Clem and Gustaf E. Winter, assignors to Rice Barton Corporation, Worcester, Mass. Filed Dec. 3, 1943. 5 claims. (Cl. 92-49).

2,390,695. Method of treating paper stock. John C. Dean and Roy T. Edwards, assignors to Socony-Vacuum Oil Company, Incorporated, New York, N. Y. Filed April 25, 1942. 4 claims. (Cl. 92-1.6). Paper stock containing pitch, while in an acid condition, is treated with an invert emulsion of a solvent for the pitch.

2,390,822. Pouring spout for paper bags and the like. Charles Wren, Toronto, Ontario, Canada. Filed Jan. 8, 1944. 3 claims. (Cl. 229-7).

2,390,909. Carton. Julius A. Zinn, Jr., Belmont, Mass. Filed Jan. 15, 1942. 7 claims. (Cl. 229-37).

2,390,977. Evening roll for flow boxes. Herman J. Williams, assignor to West Virginia Pulp and Paper Company, New York, N. Y. Filed April 16, 1941. 1 claim. (Cl. 92-44).

December 18, 1945

2,391,212. Container and closure therefor. Francis J. Williams, Port Washington, N. Y., and Morris Kaplan, Trenton, N. J.; said Williams assignor to National Lead Company, New York, N. Y. Filed Sept. 11, 1943. 2 claims. (Cl. 229-5.7). Shipping container for high-gravity materials.

2,391,230. Ammunition carton. Harry K. Dickerman, assignor to F. N. Burt Company, Inc., Buffalo, N. Y. Filed Jan. 28, 1942. 13 claims. (Cl. 93-37).

2,391,265. Paper roll supporting rack. Edward Palmer, assignor to Ohio Wax Paper Company, Columbus, Ohio. Filed Jan. 25, 1944. 4 claims. (Cl. 242-68).

2,391,285. Display container and blank therefor. Marshall I. Williamson and Raymond Fink, assignors to National Folding Box Company, New Haven, Conn. Filed Jan. 25, 1943. 5 claims. (Cl. 206-45).

2,391,296. Closure means for fiber containers. John Coyle, assignor to Continental Can Company, Inc., New York, N. Y. Filed Dec. 31, 1943. 2 claims. (Cl. 229-43).

2,391,337. Paper container structure and end closure therefor. James H. O'Neil, assignor to Continental Can Company, Inc., New York, N. Y. Filed Dec. 13, 1943. 1 claim. (Cl. 229-5.5).

December 25, 1945

2,391,539. Method of making pressure sensitive labels. Ray S. Avery, Los Angeles, Calif. Filed July 13, 1942. 2 claims. (Cl. 154-2).

2,391,566. Method and apparatus for recovering inorganic by-products from waste pulp liquor. Edward G. Goodell, Stevens Point, Wis. Filed Dec. 26, 1941. 3 claims. (Cl. 202-19). A method of spray drying and destructive distillation of the solids from waste liquors of the soda process.

2,391,619. Method of forming composite materials. Arthur K. Doolittle, assignor to Carbide and Carbon Chemicals Corporation, New York, N. Y. Filed Aug. 1, 1940. 6 claims. (Cl. 117-65). A process of coating paper with a vinyl resin and baking the coated paper at 375° to 410° F. for about 20 seconds.

2,391,620. Moistureproofing paper. Richard W. Quarles and Arthur K. Doolittle, assignors to Carbide and Carbon Chemicals Corporation, New York, N. Y. Filed June 20, 1941. 8 claims. (Cl. 117-103). A mixture of a vinyl polymer and a wax is used, the paper being baked at 375° to 400° F. for about 2 minutes.

2,391,621. Method of coating paper. George M. Powell, III, and William H. McKnight, assignors to Carbide and Carbon Chemicals Corporation, New York, N. Y. Filed Sept. 17, 1943. 1 claim. (Cl. 117-65). The coating agent is a synthetic resin (vinyl copolymer) and paraffin wax in a solvent; the paper is finally baked at 225° to 275° F.

2,391,639. Container. Reginald Meller, Oakland, Calif. Filed Nov. 12, 1940. 8 claims. (Cl. 229-23).

2,391,673. Envelope. Albert M. Broudy, Pittsburgh, Pa. Filed March 21, 1944. 2 claims. (Cl. 229-68). An envelope for binding into a printed publication.

2,391,708. Carton closing device. Warren C. Johnson and Douglas Kirk, assignors to Quaker Oats Company, Chicago, Ill. Filed June 26, 1943. 4 claims. (Cl. 93-6).

2,391,774. Container. Hans A. Eggerss, assignor to Continental Can Company, Inc., New York, N. Y. Filed Aug. 12, 1937. 3 claims. (Cl. 229-5.5).

2,391,791. Method of preparing water-resistant containers. Irving McHenry, assignor to Mid-States Gummed Paper Co., Chicago, Ill. Filed March 20, 1942. 6 claims. (Cl. 93-2).

2,391,802. Log barker conveyor. Ernest C. Shaw, assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis. Filed April 22, 1944. 4 claims. (Cl. 198-103).

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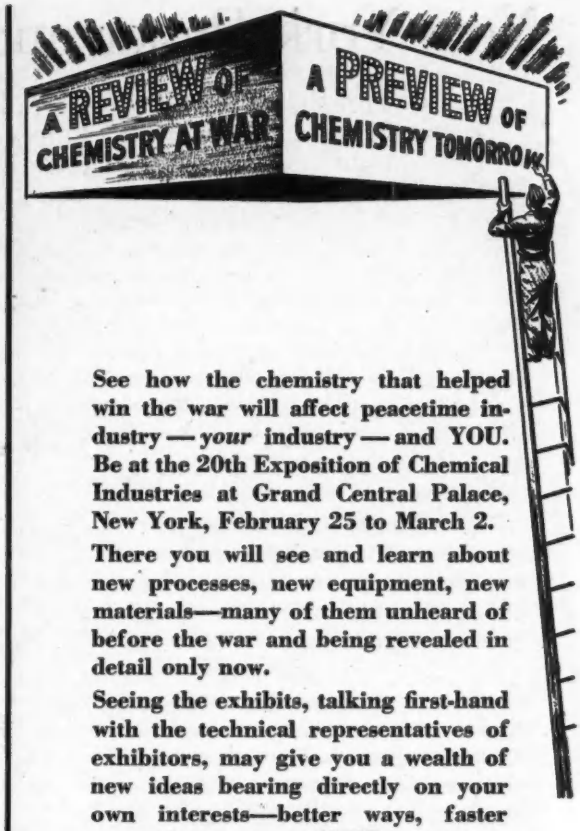

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New York Paper and Pulp Market Review

Three Changes In Manufacturers' Ceiling Prices On Book Paper Now In Effect—Wood Pulp Inventories Increased 18 Percent In October — Colored Ledgers Now In No. 1 Heavy Book Grade.

Office of the PAPER TRADE JOURNAL,
Wednesday, January 16, 1946.

Demand for paper continues heavy in the wholesale market, with the outlook favorable for a substantial increase in output for the current year. Wholesalers' sales of paper and paper products in the first 11 months of 1945 aggregated $80,003,000, an increase of 2% above the like period in 1944. Sales for November totaled $5,544,000, the Bureau of the Census reports. This is a decline of 7% from October, but a 3% increase above November, 1944. Inventories were 5% higher in November but unchanged from November, 1944.

Revised regulations of manufacturers' ceiling prices on book paper became effective January 9, 1946. Three changes are involved: (1) Dollar and cent ceiling prices for each manufacturer, formerly established on a sheet basis, have been reestablished on a jumbo roll basis. (2) Differentials for finishing and packing sheets, formerly frozen at each manufacturers' October 1941-March 1942 base period practice, are now spelled out in dollars and cents uniformly for the entire industry. (3) Ceiling prices of machine-coated book paper, formerly fixed at the highest prices charged by each manufacturer from October 1941 to March 1942, have been given new ceilings, and no reference is made to the particular method used in producing the paper as formerly was the case. These changes are covered in Amendment 3 to Revised Maximum Price Regulation 451—Book Paper.

Paper production for the week ended January 5 was estimated at 89.1%, compared with 81.0% for 1945, with 93.6% for 1944, with 85.7% for 1943, and with 103.5% for the corresponding week in 1942.

Paperboard production for the week ended January 5 was 80.0%, compared wiht 80.0% for 1945, with 86.0% for 1944, with 82.0% for 1943, and with 101.0% for the corresponding week in 1942.

Wood Pulp

Wood pulp consumption in October totaling 999,000 tons, was 124,000 tons larger than domestic production, while in September, the Bureau of the Census reports, consumption amounted to 886,000 tons and was 81,000 tons greater than production. It is significant, that while consumption was in excess of production, inventories rose 18%. The explanation for this, of course, is attributable to the increase in wood pulp imports.

The 113,000 ton increase in consumption in October over September was quite evenly distributed among the various grades of wood pulp. The largest increases were in sulphite, up 18.2%; soda, up 19.4%, and groundwood, up 20.3%. All grades of pulp showed an increase over previous months, the lowest increase being 5.1%.

Rags

Mill buying of new cotton cuttings continues active. Supplies are still relatively short, with only slow improvement indicated in current reports. The market is strong and prices are firm at ceiling levels.

Demand for old cotton rags is active at this date. Roofing mills continue to absorb good tonnages in all available grades. Prices are firm at ceiling levels.

Old Bagging

Prices in scrap bagging are reported firm but indicate no appreciable change in the limited volume of buying which has prevailed for some time.

Old Waste Paper

Mill demand for paper stock continues heavy. Although inventories at the mills continue to rise, mill buying continues steady. Prices are firm at ceiling levels.

The grade of paper stock known as "No. 1 heavy books and magazines," may now contain colored ledger stock. This change was made at the request of dealers and consumers. This is Amendment 15 to Maximum Price Regulation No. 30, Waste Paper and became effective on January 15, 1946.

TAPPI Watertown Group Discusses Starch

C. T. Fogerty of Stein-Hall Co., New York, N. Y., spoke at the meeting of the Watertown Group of TAPPI Empire State Section held January 10th. The subject was "New Developments in Starch."

The following were present: W. R. Adams, W. J. Argy, B. W. Barrows, C. S. Booth, Roy Brothers, S. A. Brunell, Ted Button, D. K. Cooper, Jr., Don Craines, Stanley Donaldson, Geo. Duers, Sven Fahlgren, C. T. Fogerty, Roy Foley, E. A. Godfrey, F. C. Goodwill, R. J. Hackett, C. F. Haskins, Walter Hebert, Martin Jaffe, Nard Jones, David T. Lawlor, T. E. Loessi, E. A. Mahannah, D. C. Mathes, H. L. Mellen, W. B. Mills, M. D. Myers, T. Newcomb, Leo P. Newton, C. H. Plantz, Henry J. Perry, H. B. Peterson, Ralph Prince, R. G. Reeder, H. Remington, H. A. Spencer, K. C. Strough, B. H. Treadwell, J. H. Treadwell, L. J. Van Alstine, J. V. Wolff, S. J. Young, A. A. Zando.

More Workers for Woods

After somewhat of a lull in pulpwood cutting operations in Quebec, attributable largely to the Christmas and New Year holiday season, workers are now taking to the lumber camps in increasing numbers. Meanwhile the Federal Labor Department, reporting that unemployed Canadian workers registered at employment offices exceed unfilled jobs by slightly over 100,000, states that there are insistent demands for men for work in the woods. The jobs offered in lumbering and logging, as registered in employment offices, number 23,596, and the Department expects from 15,000 to 20,000 additional men will go into the camps this month.

CAMACHINE 15
WINDER
FOR PAPER AND PAPER BOARD

Produces clean-cut rolls of *controlled* density, as hard or as soft as you like. Speeds up to 2000 f.p.m. on paper, and 1000 f.p.m. on paper board. Roll diameters up to 42". Built in widths of 53" to 92". A minimum strip width of 2", with special slitter attachment.

There's a CAMACHINE for YOU! WRITE FOR DETAILS

CAMERON MACHINE COMPANY
61 POPLAR STREET, BROOKLYN 2, N. Y.
MIDWEST OFFICE. 111 W. MONROE ST., CHICAGO 3, ILL.

IT'S GOOD CASEIN

IT'S...
GOOD NEIGHBOR...*
The EXTRA QUALITY BRAND...

GROUND and UNGROUND
LACTIC and RENNET

Order from your supplier. If he does not stock GOOD NEIGHBOR Brand Casein, write to us for information regarding your nearest source of supply.

*Trade Mark Reg. U. S. Pat. Off.

GOOD NEIGHBOR TRADE MARK PACKING PRODUCTS COMPANY

PACKING PRODUCTS COMPANY

271 Church Street New York 13, N. Y.

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, January 16, 1946.

BLANC FIXE—The market for blanc fixe is reported steady for the week. Current demand continues fair. The pulp is currently quoted at $40 per ton, in barrels, at works; the powder is currently quoted at $60 per ton.

BLEACHING POWDER—Demand is currently reported active. Bleaching powder is currently quoted at from $2.50 to $3.10 per 100 pounds. All prices in car lots, in drums, f.o.b. works.

CASEIN—OPA maximum prices on processed acid-precipitated casein are as follows: 10,000 pounds or more, 24 cents per pound; 2,000 pounds, 24¼ cents per pound; less than 2,000 pounds, 24¾ cents per pound, f.o.b. shipping point. Imported, 24 cents per pound.

CAUSTIC SODA—Supply situation continues short. No material improvement reported this week. Solid caustic soda is currently quoted at $2.30 per 100 pounds. The flake and ground are currently quoted at $2.70 per 100 pounds. All prices in car lots, in drums, f.o.b. works.

CHINA CLAY—Demand for most grades of china clay is reported heavy this week. Supply situation is tight. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton, at mines. Imported china clay is currently quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Demand heavy. Production gaining. Current market is tight. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b. works.

ROSIN—No offerings or sales. OPA prices: "G" gum rosin at $6.74 per 100 pounds, in barrels, Savannah. "FF" wood rosin is currently quoted at $6.70 per 100 pounds in barrels, New York. Average price of 70% gum rosin size is currently offered at $6.95 per 100 pounds, f.o.b. works.

SALT CAKE—Demand reported good. Quotations on salt cake continue to remain unchanged. Domestic salt cake is currently quoted at $15 per ton; chrome cake at $16 per ton.

SODA ASH—Market demand for soda ash continue heavy. Market tight. Bulk shipments fairly prompt. Bagged lots very slow. Prices continue unchanged. Prices on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Market supply of cash corn lower this week and under last year. Shipments lower. Corn prices are steady. Starch quotations continue unchanged. Pearl is currently quoted at $3.72 per 100 pounds. The powdered grade is currently quoted at $3.83 per 100 pounds. All prices f.o.b. Chicago.

SULPHATE OF ALUMINA—Supply situation still reported short. Quotations are unchanged. Prices on the commercial grades are quoted at from $1.15 to $1.25 per 100 pounds. The iron free is currently quoted at $1.75 per 100 pounds. All prices in car lots, in bags, f.o.b. works.

SULPHUR—Demand is reported active for sulphur. Quotations on all grades continue unchanged. Annual contracts are currently quoted at $16 per long ton, f.o.b. mines. The current contract prices at Gulf Ports remains unchanged at $17.50 per long ton.

TALC—The market for domestic talc is reported fair this week. Quotations unchanged. Domestic grades are quoted at from $16 to $21 per ton, at mines. Canadian $24 per ton. All prices in car lots.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

Standard News, per ton—			
Roll, contract	*$67.00	@	—
Sheets	75.00	@	—
* OPA Maximum Price.			
Kraft—per cwt.—Carload Quantities Zone A, Delivered			
Superstandard Wrapping	*$5.25	@	—
No. 1 Wrapping	*5.00	"	—
Standard Wrapping	*4.75	"	—
Standard Bag	*4.375	"	—
* OPA Manufacturers' Prices.			
Tissues—Per Ream—Carlots			
White No. 1	1.12½	"	—
White No. 1 M. G.	1.10	"	—
White No. 1½	1.00	"	—
White No. 2	.90	"	—
Anti-Tarnish M.F.	1.20	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Toilet—1 M. Sheets—Per Case			
Unbleached	4.25	"	—
Bleached	5.70	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.20	"	—
Bleached, Jr.	3.20	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	11.25	@	—
No. 1 Manila Wrapping, 35 lb.	6.00	"	6.25
Boards, per ton—			
News	*50.00	@	—
Chip	*50.00	"	—
Sgl. Mla. Lt. Chip	*62.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*63.00	"	—
Binders Boards	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1	$39.10 @ $46.00	$40.25 @ $47.25
100% Rag	32.20 " 37.75	33.35 " 39.25
85% Rag	.... "	29.90 " 35.00
75% Rag	23.00 " 27.00	24.15 " 28.25
65% Rag	.... "	22.80 " 27.75
50% Rag	18.70 " 22.75	19.90 " 24.25
25% Rag	16.40 " 20.00	17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$10.55 @ $12.75	$11.70 @ $14.25
No. 2	9.65 " 11.75	9.80 " 13.25
No. 3	9.20 " 11.25	10.35 " 12.50
No. 4	8.90 " 10.75	10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Papers. Delivered in Zone 1:

No. 1 Glossy Coated	$13.65	@	$13.80
No. 2 Glossy Coated	12.40	"	14.00
No. 3 Glossy Coated	11.60	"	11.80
No. 4 Glossy Coated	11.15	"	12.70
No. 1 Antique (watermarked)	10.25	"	11.70
No. 2 Offset	9.60	"	11.00
A Grade E. F.	9.35	"	10.70
A Grade S. & S. C.	9.60	"	11.00
B Grade E. F.	8.85	"	10.20
B Grade S. C.	9.10	"	10.50
C Grade E. F.	8.55	"	9.70
C Grade S. C.	8.80	"	10.00
D Grade E. F.	8.25	"	9.30
D Grade S. & S. C.	8.50	"	9.70

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight Not Exceeding OPA Allowances.

Bl. Softwood Sulphite	$86.00
Unbl. Softwood Sulphite	74.00
Bl. Hardwood Sulphite	83.50
Unbl. Hardwood Sulphite	71.50
Bl. Mitscherlich	81.00
Unbl. Mitscherlich ..72.00 @	82.00
N. Bleached Sulphate	86.00
S. Bleached Sulphate	79.00
N. Semi-Bleached Sulphate	82.00
S. Semi Bleached Sulphate	75.00
N. Unbl. Sulphate	73.00
S. Unbl. Sulphate	68.50
Bl. Soda	76.00
Unbl. Soda	72.00
Groundwood	58.00

Transportation Allowances

Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area)	10.50
West Coast (out area)	16.50

	50%-80% Air Dry Weight
Northeast	11.50
Lake Central	11.50
Southern	14.00
West Coast (in area)	9.50
West Coast (out area)	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	6.50	@	7.25*
Silesias No. 1	—	"	5.75*
New Unbleached	6.75	"	7.50*
Blue Overall	—	"	3.50*
Fancy	—	"	3.50*
Washables	—	"	3.00*
Bleached Khaki Cuttings	—	"	4.25*
Unbleached Khaki Cuttings	—	"	3.50*

*OPA Maximum Prices

WHAT DO YOUR FELTS LOOK LIKE?

THE FELT on the right has been treated with a Magnus Felt Reconditioner . . . with its condition before treatment shown at the left. You could get mighty little absorption from that dirty felt. It's loaded and hard . . . its nap is gone. Reconditioning brought back the original qualities of the felt. Loading was completely removed . . . the nap was lifted, and full absorbing properties were restored.

Magnus Felt Reconditioners

are available in an adequate range of types to meet the definite operating and loading problems of every paper mill. They range from Magnus Feltex for ordinary felt reconditioning, to Magnus D-Scale-R for removing lime deposits from badly contaminated felts. There are types for conditioning felts on the machine and off. Some of them greatly speed up the operation of breaking in a new felt on the machine.

If your present felt cleaning methods and/or materials are not giving you completely satisfactory results, why not ask us to send a liberal sample of the Magnus Felt Reconditioner best suited to your particular problem for a thorough trial?

MAGNUS CHEMICAL CO., 24 SOUTH AVE., GARWOOD, N. J.

MAGNUS Paper Mill Cleaners

MONO-PLANE weave

APP-WELD PATENTED SEAMLESS JOINT

APPLETON PHOSALOY WIRES THE STANDARD OF QUALITY

Appleton Wires are Good wires

APPLETON WIRE WORKS, INC., APPLETON, WIS.

Old Rags

White, No. 1—			
Repacked	*3.80	"	—
Miscellaneous	*3.20	"	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Thirds and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.30	"	—
Roofing Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—
Old Manila Rope	5.75	"	—

* OPA Maximum Prices.

Foreign Rags

Pre-War Quotations
All Prices Nominal

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	3.25	"	3.25
No. 1 White Cottons	4.25	"	4.75
No. 2 White Cottons	3.25	"	3.75
No. 3 White Cottons	2.50	"	3.00
No. 4 White Cottons	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Med. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shapperies	1.30	"	1.45
New Shapperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.25	@	3.30
Wool Tares, light	3.25	"	3.50
Wool Tares, heavy	3.50	"	3.75
Bright Bagging	3.25	"	3.50
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	5.50	"	—
No. 1 Sisal Strings	*4.00	"	—
Mixed Strings	2.00	"	—

* OPA Maximum Prices.

Old Waste Papers

(F. o. b. New York)
OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½ @	—
No. 1 Hard White Envelope Cuts	3.12½"	—
No. 1 Hard White Shavings, unruled	2.87½"	—
No. 1 Hard White Shavings, ruled	2.50 "	—
Soft White Shavings, one cut	2.87½"	—
No. 1 Soft White Shavings	2.50 "	—
Soft White Shavings, Misc.	2.15 "	—
No. 1 Fly Leaf Shavings	1.67½"	—
No. 2 Fly Leaf Shavings	1.12½"	—
No. 1 Groundwood Fly Leaf Shavings	1.25 "	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90 "	—
Mixed Colored Shavings	.75 "	—
Mixed Groundwood Colored Shavings	.90 "	—
Overissue Magazines	1.67½"	—
No. 1 Heavy Books & Magazines	1.92½"	—
Mixed Books	1.10 "	—
No. 1 White Ledger	2.30 "	—
No. 2 Mixed Ledger, colored	2.00 "	—
New Manila Envelope Cuttings, one cut	2.87½"	—
New Manila Envelope Cuttings	2.65 "	—
Extra Manilas	1.95 "	—
Mixed Kraft, Env. & Bag Cuttings	2.75 "	—
Kraft Envelope Cuttings	3.25 "	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50 "	—
New 100% Kraft Corrugated Cuttings	2.25 "	—
No. 1 Assorted Old Kraft	1.75 "	—
New Jute Corrugated Cuttings	.90 "	—
Old 100% Kraft Corrugated Containers	1.75 "	—
Old Corrugated Containers	1.40 "	—
Box Board Cuttings	.72½"	—
White Blank News	1.65 "	—
Overissue News	1.10 "	—
No. 1 News	1.00 "	—
No. 1 Mixed Paper	.95 "	—
Old Corrugated Containers	.82½"	—
Mill Wrappers	1.10 "	—

Twines

All Prices Nominal
(F. o. b. Mill)

(Soft Fiber)			
Coarse Polished—India	.21	@	—
White Hemp	.21	"	—
Fine Polished—Fine India	.26	"	—
Unpolished—Box	.17½	"	—
Paper Makers	.17	"	—
Tube Rope	.19	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—
(Hard Fiber)			
Medium Java	.18	"	—
Mex. Sisal	.16	"	—
Manila	—	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill)

Shirt Cuttings—	
New White No. 1	.07¼
New White No. 2	.05¼
Light Silesias	.05¼
Black Silesias, soft	.03½
New Unbleached	.07½
Washable Prints	.04¼
Washable No. 1	.03
Blue Overall	.05½
Cottons—According to grades—	
Washable Shredding	.01¾
Fancy Percales	.04¼
New Black Soft	.03¼
Khaki Cuttings—	
Unbleachable Cotton Cuttings	.03½
Bleachable Cotton Cuttings	.04½
Men's Corduroy	.03½
Ladies' Corduroy	.03
Cottonades	.03¼

Domestic Rags (Old)

White No. 1—Repacked	3.80	@	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	"	—
White No. 2—Repacked	2.90	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings—			
(Report)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	@	3.50
No. 1 Clean bright—Sisal Strings	.04	"	—
No. 2 Clean bright—Sisal Strings	.03	"	—
Sisal Jute	.02½"		.02¾
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.80
Wool Tares, heavy	4.00	"	4.25
No. 1 New Light Burlap	1.80	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila.)
OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	2.37½"	—
No. 1 Hard White Shavings, unruled	2.87½"	—
Soft White Shavings, one cut	2.50 "	—
White Blank News	1.65 "	—
Soft White Shavings, Misc.	1.25 "	—
No. 1 Hard White Shavings, ruled	2.50 "	—
No. 1 Soft White Shavings	2.15 "	—
No. 1 Fly Leaf Shavings	1.67½"	—
No. 2 Fly Leaf Shavings	1.12½"	—
No. 1 Groundwood Fly Leaf Shavings	1.25 "	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90 "	—
Mixed Colored Shavings	.75 "	—
Mixed Groundwood Colored Shavings	.90 "	—
Overissue Magazines	1.67½"	—
No. 1 Heavy Books & Magazines	1.92½"	—
Mixed Books	1.10 "	—
No. 1 White Ledger	2.30 "	—
No. 2 Mixed Ledger, colored	2.00 "	—
New Manila Envelope Cuttings, one cut	2.87½"	—
New Manila Envelope Cuttings	2.65 "	—
Extra Manilas	1.95 "	—
Mixed Kraft, Env. & Bag Cuttings	2.75 "	—
Kraft Envelope Cuttings	3.25 "	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50 "	—
New 100% Kraft Corrugated Cuttings	2.25 "	—
No. 1 Assorted Old Kraft	1.75 "	—
New Jute Corrugated Cuttings	.90 "	—
Old 100% Kraft Corrugated Containers	1.75 "	—
Old Corrugated Containers	1.40 "	—
Box Board Cuttings	.72½"	—
White Blank News	1.65 "	—
Overissue News	1.10 "	—
No. 1 News	1.00 "	—
No. 1 Mixed Paper	.95 "	—
Old Corrugated Containers	.82½"	—
Mill Wrappers	1.10 "	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	2.75	@	2.90
Sisal Rope No. 1	*4.75	"	—
Sisal Rope No. 2	* —	"	4.00
Mixed Rope	—	"	1.55
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	4.50	"	5.00
Jute Carpet Threads	3.00	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	3.00	"	3.25
South American	—	"	3.25

BOSTON

Old Papers

(F. o. b. Boston)
OPA Maximum Prices, Baled

No. 1 Hard White Shavings, unruled	2.87½ @	—
No. 1 Hard White Shavings, ruled	2.50 "	—
Soft White Shavings, Misc.	2.15 "	—
No. 1 Fly Leaf Shavings	1.67½"	—
No. 2 Fly Leaf Shavings	1.12½"	—
No. 1 Groundwood Fly Leaf Shavings	1.25 "	—
No. 2 Groundwood Fly Leaf Shavings	.90 "	—
Mixed Colored Shavings	.75 "	—
New Manila Envelope Cuts, one cut	2.87½"	—
Hard White Envelope Cuts, one cut	3.37½"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50 "	—
Mixed Kraft Env. & Bag Cuttings	2.75 "	—
Kraft Envelope Cuttings	3.25 "	—
No. 1 Heavy Books & Magazines	1.92½"	—
New Manila Envelope Cuts, one cut	2.87½"	—
New Manila Envelope Cuttings	2.65 "	—
White and Colored Tabulating Cards	2.25 "	—
Ground Wood Tabulating Cards	1.35 "	—
White Blank News	1.65 "	—
No. 1 Assorted Old Kraft	1.75 "	—
No. 1 Mixed Paper	.95 "	—
Overissue News	1.10 "	—
Box Board Cuttings	.72½"	—
New Corrugated Cuttings, Kraft	2.25 "	—
Old 100% Kraft Corrugated Containers	1.75 "	—
Old Corrugated Containers	1.40 "	—
Jute Corrugated Cuttings	1.07½"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	2.75	@	2.90
Sisal Rope No. 1	*4.75	"	—
Sisal Rope No. 2	* —	"	4.00
Mixed Rope	—	"	1.55
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	4.50	"	5.00
Jute Carpet Threads	3.00	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	3.00	"	3.25
South American	—	"	3.25
Wool Tares—Foreign	(nominal)		
Domestic	4.25	"	—
Aust. Wool Pouches	—	"	3.65
New Zealand Wool Pouches	—	"	3.90
New Burlap Cuttings	4.75	"	5.00
Heavy Baling Bagging	4.00	"	4.25
Paper Mill Bagging	3.50	"	3.80
No. 2 Roofing Bagging	1.15	"	—

* OPA Maximum Prices.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—	
New Light Prints	.04½ @ .04¾
Fancy Percales	.04¼" .05
New White No. 1	.06¼" .07
New Light Flannelettes	.05½" .06
Canton Flannels, Bleached	.06 " .06½
Underwear Cutters, Bleached	.06¼" .06½
Underwear Cutters, Unbleached	.05¼" .06
Silesias No. 1	.06 " .06½
New Black Silesias	.03 " .03½
Red Cotton Cuttings	.03½" .04
Soft Unbleached	.06½" .06¾
Blue Chevlots	.05½" .06
Fancy	.03¾" —
Washable	.02¾" —
Khaki Cuttings	.02¾" .03
O. D. Khaki	.03½" .03½
Corduroy	.03½" .03½
New Canvas	.06½" .06¾
B. V. D. Cuttings	.06¾" .07¼

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—
Miscellaneous	3.20	"	—
White No. 2—			
Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.90	"	—
Old Blue Overalls	2.25	"	2.30
Thirds and Blues, Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—
No. 2	1.45	"	—
No. 3	1.35	"	—
No. 4	1.34	"	—
No. 5, Quality A	1.35	"	—
Quality B	1.30	"	—
Quality C	.95	"	—
Old Manila Rope	5.75	"	—

* OPA Maximum Prices.

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)
OPA Maximum Prices, Baled

Shavings—		
No. 1 Hard White Envelope Cuts, one cut	3.37½ @	—
No. 1 Hard White Shavings, unruled	2.87½"	—
No. 1 Soft White Shavings	2.50 "	—
No. 1 White Ledger	2.30 "	—
No. 1 Heavy Books & Magazines	1.92½"	—
White Blank News	1.65 "	—
Mixed Kraft Env. & Bag Cuttings	2.75 "	—
No. 1 Assorted Old Kraft	1.75 "	—
Overissue News	1.10 "	—
No. 1 News	1.00 "	—
No. 1 Mixed Paper	.95 "	—
No. 1 Roofing Rags	1.55 "	—
No. 1 Roofing Bags	1.45 "	—